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EXECUTIVE SUMMARY

Latin America and the Caribbean offer a lot of opportunities for investment and are in many ways a perfect partner for Chinese companies as there are many converging interests, as demonstrated by the growth in investment between 2005 and 2015. Successful investment in the region and its countries rests on diligent preparation and execution of a suitable environmental and social strategy supporting investment, construction, operation and growth by China's multinationals. The scope of activities is expanding from an initial focus on primary mineral and hydrocarbon commodities to agricultural production, infrastructure investment, power generation, etc. creating further visibility and an ever growing need for Chinese investors to strengthen their social license to operate through their understanding of local expectations and commitment to sound environmental, health and safety (EHS) performances.

This Technical Note is primarily intended for use by Chinese investors and EPC firms, specifically senior management and decision makers responsible for the planning, design and delivery of the EHS strategy and safeguards when operating in LAC. It may also be used as a reference for LAC governments and companies. The Technical Note focuses primarily on mining, oil and gas (i.e. extractive), infrastructure and agriculture activities as key sectors; although there is recognition that large projects may involve associated facilities such as roads, railroads, dams or transmission lines. Regional context and regulations are focused on three countries, Brazil, Mexico, and Peru, given the growing Chinese investments in these countries and the advancements of their EHS regulations. The Technical Note is practical and generic in order to be applicable to the construction of various project types throughout LAC. Case studies for specific projects and industries can be found in *Appendix A*.

Business Case for Good EHS Practice

- ✓ The extractive industry, large infrastructure and large-scale commodity-based agricultural projects can generate significant social, economic and environmental changes.
- ✓ Environmental degradation, pollution, violations of workers' rights, impacts to public health and access to ecosystem services are often the cause for social opposition and conflict.
- ✓ The construction phase is where EHS issues and social conflict most commonly occur.
- ✓ EHS-related impacts and risk can represent material costs to projects through lost productivity, materials damage, reputational risks and ultimately project delays. Staff time can also be costly when diverted to manage conflicts.
- ✓ Some recent large scale infrastructure and industry projects in LAC have caused environmental degradation, threats to biodiversity and social conflict. Other examples show willingness of investors to

address environmental issues comprehensively and dialogue with stakeholders and governments. Case studies are presented in *Appendix A* of this Technical Note.

EHS Regulatory Context

- ✓ EHS legislation in LAC is becoming more comprehensive to align with international standards, regional trade agreements, international treaties and civil society awareness
- ✓ Environmental impact assessments are the foundation for environmental permitting throughout LAC, often requiring substantial consultation and disclosure of information to stakeholders. Various other EHS permits may be required depending on the site characteristics and local regulations (e.g. natural resources extraction, land use, waste disposal).
- ✓ The Ministry of Environmental Protection in China issued *Guidance on Environmental Protection for Outbound Investment and Cooperation*, which contains general EHS recommendations for overseas projects of Chinese companies.
- ✓ The China International Contractors Association also published a *Guide on Social Responsibility for Chinese International Contractors (2012).*

See *Appendix B* and *Appendix C* for listings of regulatory resources and references of international good practices.

Good Management Practices

The focus of this Note is on environment, occupational health and safety (OHS), and community health and safety aspects of the construction phase of project activities in the following key sectors: mining, oil and gas, agribusiness, and infrastructure.

Environmental Aspects	Occupational Health and Safety Aspects	Community Health & Safety Aspects
erosion,	over-exertion,	general site hazards,
sediment mobilization and transport,	slips and falls,	disease prevention,
contamination and disturbance to water bodies,	work in heights,	traffic safety, and
noise and vibration,	struck by objects,	engagement with affected communities
dust and air quality,	moving machinery,	
solid waste,	confined spaces and excavations,	
hazardous waste, and	other hazards to workers	
contaminated land		

Best practice calls for risks and impacts identification to be done as early as possible in the project cycle so that any required mitigation and management measures can be incorporated into the project site selection, design and engineering process, and project permits and authorizations. The Note provides practical measures and their rationale for controlling and managing specific key risks and impacts associated with each aspect during construction; and a description of best practice mitigation measures.

The international good EHS management practices and standards are most effectively developed and implemented through a management system designed for a specific project. Mitigation measures should fit within the framework of a management system that follows the Plan–Do–Check–Act (PDCA) model. Management systems should, as a minimum, aim for compliance with local regulations and reflect the involvement and responsibilities of the developer and subcontractors. International best practice indicates that the specific measures within a management system should follow the mitigation hierarchy starting with avoidance, minimization, mitigation and finally adaptation. Examples are provided for each aspect covered in this Note according to this hierarchy.

Actively managing financial and reputational risks has become a key task for modern internationally oriented companies. While companies having neglected to address EHS aspects of their business have faced serious threats to their business model and investments, those adopting good practices have enhanced their risk management and increased their opportunities for growth. Investors and contractors strengthening their social and environmental license to invest, build and operate often see a reduction in delays and associated costs and expand their business projects in investment countries.

An engagement in foreign countries in overseas region nearly always poses some considerable risks and challenges, but our experience in advising different companies from different regions shows that these risks can be mitigated and the challenges addressed. Actually the companies which have a management system and a broad base of in-house know how to deal with these issues are those which have the best chances to expand and globalize their business successfully.

1.0 INTRODUCTION

Applicability and Intended Audience
This Technical Note is primarily intended for use by Chinese investors and EPC firms, specifically senior management and decision makers responsible for the planning, design and delivery of the EHS strategy and safeguards when operating in LAC. It may also be used as a reference for LAC governments and companies The Technical Note focuses primarily on mining, oil and gas (i.e. extractive), infrastructure and agriculture activities as key sectors; although there is recognition that large projects may involve associated facilities such as roads, railroads, dams or transmission lines. Regional context and regulations are focused on three countries, Brazil, Mexico, and Peru, given the growing Chinese investments in these countries and the advancements of their EHS regulations. The Technical Note is practical and generic

Over the past decade, a significant increase in Chinese trade and investment in Latin America and the Caribbean (LAC)[i] has propelled the commodity boom in the region, especially in the mining, oil and gas and agricultural sectors (Ray, 2015; Davis, 2014). These sectors have also been the source of conflict over land rights, environmental degradation, working conditions and human health. Local communities' reactions to these issues range from complaints to protests and road blockades and may involve the use of security forces that result in injuries and even death. These situations have significant costs –primarily to human lives and the environment, but also direct costs to investments and the economy (Davis, 2014).

Although many middle-income countries in LAC have developed robust legislation to protect the environment and human wellbeing; other countries are lagging behind and in many cases enforcement and governance structures are insufficient. China has significantly advanced social and environmental safeguards for outbound investments as well as its 'Green Credit' guidelines for project finance abroad (see *Appendix C* for references), yet again, enforcement and transparency in LAC countries remain a challenge. As the global economy slows down, LAC countries will be pressured to streamline their environmental and social requirements to attract more investment (Ray, 2015). It is thus critical that all interested parties understand the importance and need for adequate environmental, health and safety practices to reduce the risks and maximize the investment opportunities.

[i] The Inter-American Development Bank (IDB) includes the following 26 LAC member countries: Argentina, Bahamas, Barbados, Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Suriname, Trinidad y Tobago, Uruguay and Venezuela. Other LAC countries that are non-IDB members include: Antigua and Barbuda, Aruba, Cayman Islands, Dominica, Cuba, French Guyana, Grenada, Guadalupe, Martinique, St, Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines and Turks and Caicos.

This Technical Note on existing Environmental, Health and Safety (EHS)[ii] Good Practice has been developed by the Inter-American Development Bank (IDB) to support Chinese investors and engineering, procurement and construction (EPC) firms –the target audience- in better understanding of the regional context, regulations and practices for EHS across LAC. The Technical Note aims to bridge perceived or existing knowledge and cultural gaps to support the adoption and integration of EHS good practices into the planning and construction phases of projects. Ultimately, it intends to help achieve the sustainable development goals of the region, safeguarding the wellbeing of communities, protecting the environment and supporting economic growth.

[ii] The scope of the Technical Note is focused on the environmental, health and safety aspects and does not include good practices for biodiversity conservation, social impacts or other related aspects. It is recommended that these aspects be further developed.

2.0 BUSINESS CASE FOR GOOD ENVIRONMENTAL, HEALTH AND SAFETY PRACTICE

Summary Review - Business Case for Good EHS Practice

- ✓ The extractive industry, large infrastructure and large-scale commodity-based agricultural projects can generate significant social, economic and environmental changes.
- ✓ Environmental degradation, pollution, violations of workers' rights, impacts to public health and access to ecosystem services are often the cause for social opposition and conflict.
- ✓ The construction phase is where EHS issues and social conflict most commonly occur.
- ✓ EHS-related impacts and risk can represent material costs to projects through lost productivity, material damage, reputational risks and ultimately project delays. Staff time can also be costly when diverted to manage conflicts.

The extractive industry can generate significant social, economic and environmental change to the regions in which they operate, which can lead to conflict between the company and local communities (Davis, 2014). Similarly, large-scale, commodity-based agricultural projects can also cause significant environmental impacts and social conflict around access to or competition for land and water resources, child labor, market prices, among others. Environmental degradation, pollution, neglect of workers' rights, deterioration of public health and access to ecosystem services represent direct costs to communities, companies and governments and can cause social opposition to projects. Recent studies and research have demonstrated that poor management of EHS issues triggers social conflicts that result in significant economic losses.

A Goldman Sachs (2008) study of 190 major capital projects operated by international investors in the extractive industries showed that the time needed for projects to come online has nearly doubled in the last decade, causing significant increase in cost (Goldman Sachs, 2008). A confidential follow-up study of a subset of those projects found that non-technical (EHS and social) risks accounted for almost half of the total risks faced by companies—and that stakeholder-related risks constituted the single largest category (Ruggie, 2010).

A study on *"Cost of Company – Community Conflict in the Extractive Sector"* published by Davis and Franks of the Harvard Kennedy School's Corporate Social Responsibility Initiative (Davis, 2014) found that environmental issues were the most common issues to precipitate conflict. In fact, nearly 80% of the studied cases (n=50) had issues of pollution as a cause of conflict, and nearly 70% had issues of access to or competition over resources as a cause. This study also found that the construction phase was the most common stage at which projects were suspended and/or abandoned due to conflicts. The research found that the most frequent costs of company-community conflict were those arising from lost productivity due to temporary shutdowns or delay. The greatest costs of conflict were the opportunity costs in terms of the lost

value linked to future projects, expansion plans, or sales that did not go ahead. The costs most often overlooked by companies were indirect costs resulting from staff time being diverted to managing conflict – particularly senior management time, including in some cases that of the CEO. Examples of cost of EHS and social conflict are shown in *Box 1*.

Box 1 *Magnitude of Costs Involved in Non-Technical Risks*

One company had undertaken a systematic review of the potential costs of non-technical risks connected to its various projects and identified a significant figure – a value erosion of more than $6 billion over a two-year period, representing a double-digit percentage of its annual profits – which it used to attract Board-level attention to these issues.

In February 2006, the developers of the Esquel Mining project in Argentina were forced to write down US$379 million in assets and forego development of US$1.33 billion in projected reserves. In 2003, the owners of the Tambogrande Mining project in Peru reported an asset write-down of US$59.3 million following the abandonment of the proposed project, with reserves valued at the time at US$253 million.

And in November 2012, the owners of the Conga gold and copper mine project in Peru suspended construction at the request of the Peruvian government following community conflict over water resources. The estimated life production of the deposit is 15-20 million ounces of gold and 4-6 billion pounds of copper, with Newmont, the majority owner (51.35%), reporting capital expenditure of US$1.45 billion between 2010 -2012. Minority partner (43.65%) Compañía de Minas Buenaventura reported capital expenditure of US$498 million on Minas Conga in 2012.

Source: Adapted from Davis, 2014.

Research led by the Boston University Global Economic Governance Initiative (2015) indicates that LAC exports to China and Chinese investments in the region have concentrated in primary commodities (Ray, 2015). Primary-sector activities –especially extractives- support fewer jobs than manufacturing or agricultural exports, and an estimated 20% fewer jobs per US$1 million than the overall exports. Because of this focus on primary commodities, LAC exports to China also represent twice as much water use and 12% more net greenhouse gas (GHG) emissions per dollar, compared to overall exports. This sector focus puts the projects often under much higher public scrutiny than projects in other sectors. Thus it is especially important to make sure that Chinese-financed infrastructure investments, including roads and dams,– do not pose serious threats to deforestation and biodiversity in some of the LAC's most biodiverse areas. There are some cases reported in the literature where Chinese investors in LAC, such as the Chinalco mine in Peru and Golden Dragon Affiliates in Mexico (see *Box 2*), demonstrated a willingness and ability to work with governments and local communities, indicating progress in the right direction (Ray, 2015). Nevertheless, major challenges for companies in the in the primary commodity and infrastructure sectors exist: They get often get mixed signals, especially considering LAC's tendency to relax its existing environmental and social regulations to maintain investor interest in the region; the lack of enforcement, governance and transparency of some governments in LAC and the application of a different set of EHS

standards by new investor models, such as China, that may differ from the traditional standards required by the international development finance institutions or by traditional investors (Ray, 2015).

The role of local communities and civil society is crucial in these ongoing changes and should be taken into consideration. Civil society groups often are the major forces for recent policy advances and regulatory changes and also serve as informal oversight mechanisms to hold investors and companies accountable. In addition, consumer choices represent major forces for market trends, such as prioritizing certified food products or selecting renewable energy supply.

Box 2 *Examples of Chinese Companies' Dialogue with Governments in LAC*

Example 1: In March 2014, Chinalco's Toromocho mine project in Peru suffered a major setback when the environmental enforcement authority (OEFA), ordered it to halt operations following a leak of acid wastewater. The problem was generated by unexpectedly heavy rainfall, which Chinalco had apparently not taken into account. After the cleanup, which happened in a period of a few days after rapid action by regulators and Chinalco, the Association of Chinese Companies in Peru asked the Environment Ministry to organize a series of conferences for all of their members about Peru's environmental regulations. This was an opportunity for the government to address environmental concerns in a proactive way as well as to form working relationships with environmental and safety personnel at the investing firms, and to lay the groundwork for future cooperation (Ray, 2015).

Example 2: The Chinese Golden Dragon Affiliates (GDA), a copper tube manufacturing company has a facility in Monclova, Mexico that has to meet several environmental standards and has to report its performance periodically on several fields. It has to file an annual report for SEMARNAT (*Cédula de Operación Anual, COA*) on its emissions to the atmosphere, its discharges into the water system, and its hazardous wastes and their disposal. This enterprise complies with this requirement; and it has been making an effort to improve its reports, as a way to keep a better record of its own environmental performance. GDA does quite well in this, considering that the environmental authority in Coahuila has a very limited capacity to keep track of the 3,000 companies they need to monitor. Very few of them prepare a COA, they pledge their accuracy under oath and only very seldom are they inspected (Schatan, 2015).

Table 1 below presents a summary of the types of costs that may be experienced by companies operating in LAC, as a result of poor EHS management and social conflict.

Table 1 *Types of Costs Associated with EHS and Resulting Social Conflicts in Projects*

Types of Costs to Companies	
Security	• Payments to state forces or company security contractors • Increased operational costs to security: fences, escorts, alarms, monitoring systems, reduced mobility • Increased security training and management: staff time, lost production, cost of programs
Project modification	• Design modification costs: application, redesign, legal procedures • Additional works

	• Engineering/ planning time
Risk management	• Insurance: higher premiums and coverage, risk rating, withdrawal of coverage • Legal and conflict expertise: specialist training for staff, additional staff
Material damage	• Damage or destruction to private property or infrastructure • Damage or destruction to public property or infrastructure
Lost productivity	• Operations discontinued: voluntary closure or enforced through injunction • Temporary shutdown of operations • Lost opportunity for future expansion and/or for new projects • Disruption to production: temporary or indefinite delays, absenteeism • Delays in deliveries/supplies • Greater regulatory burden/scrutiny
Capital	• Loss of value of property: full write-off, other depreciation, sale at a loss • Inability to repay debt or default on debt • Difficulty raising new capital • Share price instability/loss in value (within relevant time period)
Personnel	• Staff time spent on risk and conflict management • Costs of remediation: meetings, negotiations, mediators • Hostage-taking: ransom payments, rescue operations, compensation • Arrests of staff • Injuries to staff and fatalities • Low morale and stress-related effects • Retention: higher salaries, compensation packages, bonuses • Recruitment: advertising positions, screening, interviewing, induction training
Reputation	• Higher expenditure on public relations: consultants, dissemination of information • Competitive loss/disadvantage: impact on brand, investor confidence
Redress	• Compensation (out of court payments); • Fines • Increased social and environmental obligations: health care, education and training, provision of other services, clean-up and remediation costs • Costs of administrative proceedings or litigation: costs of proceedings themselves, judgment/settlement costs.

Source: Davis, 2014

3.0 EHS REGULATORY CONTEXT

Summary Review - EHS Regulatory Context

- ✓ EHS legislation in LAC is becoming more comprehensive to align with international standards, regional trade agreements, international treaties and civil society awareness
- ✓ Environmental impact assessments are the foundation for environmental permitting throughout LAC, often requiring substantial consultation and disclosure of information to stakeholders. Various other EHS permits may be required depending on the site characteristics and local regulations (e.g., natural resources extraction, land use, waste disposal).
- ✓ The Ministry of Environmental Protection in China issued *Guidance on Environmental Protection for Outbound Investment and Cooperation*, which contains general EHS recommendations for overseas projects of Chinese companies.
- ✓ The China International Contractors Association also published a *Guide on Social Responsibility for Chinese International Contractors (2012)*.

This Section provides an overview of environmental, health, and safety (EHS) regulations in LAC, with a focus on three countries—Brazil, Mexico, and Peru—and a parallel overview of Chinese EHS regulations. The LAC regional context is first examined from an international perspective, describing some of the trends and triggers that have moved the EHS regulatory agenda forward as well as the relevance of international treaties and conventions adopted. The national context is then described for the three target countries, providing a regional overview of the commonalities and differences of the regulatory and institutional frameworks, as well as the permitting approaches. This section also provides a comparison of the selected LAC countries with the regulatory framework in China, highlighting the permitting and regulatory approach that Chinese companies might be familiar with and comparing it to the frameworks most commonly seen in LAC. As reference, *Appendix B* presents the primary EHS governing bodies and the main legislation, regulation and norms related to EHS for the three focus countries and for China. It is important to note that this is not a comprehensive list of the legal and regulatory framework or permitting requirements, but intended to guide the reader on the overarching EHS regulations and sources of information. This section does not discuss the regulatory requirements for public consultation and disclosure or stakeholder engagement, nor does it delve extensively into the environmental impact assessment (EIA) permitting requirements.

3.1 REGIONAL CONTEXT

The trend in environmental law in LAC has been growing towards more comprehensive and specific laws in part due to expanding international and regional trade agreements (Kadas and Fraker, 2014); international benchmarking with more developed countries (e.g., OECD countries) as the LAC economy grows; and the alignment with international financing

requirements (e.g., Equator Principles, UNEP Finance Initiative, IFC Performance Standards) (see
Box 3). This represents a significant development from the foundational framework laws that were initiated in the mid-1990s (Paez, 1996), as more LAC countries are incorporating environmental protection into their national constitutions (Kadas and Fraker, 2014; OEFA 2014) and mainstreaming EHS requirements into the countries' development plans.

Box 3 Key Influences Driving EHS Legislation in LAC

- Free trade agreements, especially with the US
- International project finance requirements
- Development assistance from bilateral and multilateral institutions
- NGO and civil society awareness and drive,
- International conventions and treaties adopted by countries
- International benchmarking

Source: Adapted from Kadas and Fraker, 2014.

Regulatory frameworks tend to be license-intensive, with environmental impact assessments (EIA) acting as the basis for environmental permitting of a project (Kadas and Fraker, 2014). In LAC, the permitting and licensing process is complex and usually involves inter-institutional coordination from regulating agencies (World Bank, n.d.). Most countries require public consultation as part of the EIA process and final permitting approval takes anywhere from six months to more than a year. However, some countries are working to streamline the permitting process.

Another notable trend in LAC is an increased transparency (IDB, 2012; Kadas and Fraker, 2014), through new laws and regulations requiring more robust consultation and public disclosure of project information that can directly affect communities. However, both civic participation and consideration of the results of consultation in project decision-making are still in its initial phases in most countries. Access to the legal framework and regulations in LAC is standard practice and most commonly available online. Regarding project permitting, most LAC countries have specific requirements to disclose project impact assessment information (i.e., EIAs) as part of the review and permitting process (see Box 4). EIA information is publicly disclosed, in many cases electronically or in hard copy; while in some countries there are specifications to ensure disclosure requirements that are culturally appropriate (e.g., local language, verbal presentations, open house forums, workshops and public hearings). Once approved, EIAs and their permits remain accessible to the public. While a lot of this trend has come from legislature, much has also come from the civil sector. More scrutiny for public finances for public sector projects has also been a driving force.

Box 4 Transparency and Access to Information

Chile's Environmental Assessment Office (*Servicio de Evaluacion Ambiental – SEA*) is a decentralized office dedicated to the evaluation of projects against the environmental laws and regulations, facilitating inter-institutional review and

public consultation. SEA manages a public database that hosts the projects' information, including all administrative processes such as submissions, comments, replies, permits, among others. All communications between project sponsor and government authorities regarding a project's environmental permitting is disclosed. Information is easily accessible online (www.sea.gob.cl). In addition, the Ministry of Environment in Chile established a unique electronic database for registering and analyzing pollutant release and transfer (*Registro de Emisiones y Transferencia de Contaminantes – RETC*) reported by companies within the legal framework. This information is analyzed and disclosed for environmental management purposes (http://www.retc.cl/).

There is a trend toward increasing fiscal penalties for environmental infractions as enforcement of environmental law is also increasing (Kadas and Fraker, 2014); in addition, criminal penalties for environmental responsibilities or liabilities are also present in some legislation. Most LAC countries have, in the past 15-20 years, created a centralized environment authority (e.g., Ministry of Environment) and health authority (e.g., Ministry of Health) with varying degrees of regulatory and enforcement power. There is a notable trend for increased capacity to support EHS regulatory compliance.

The adoption of international environmental, health and safety conventions is generally widespread in LAC. There is international recognition of the regions' high biodiversity and cultural values, including several megadiverse countries, such as Brazil, Mexico and Peru. These countries also happen to be rich in natural resource extraction (i.e., mineral, oil and gas, timber and agricultural commodities) and natural capital, and thus deserve proper attention and protection due to the role they play in global sustainability. Not surprisingly, all IDB member countries are signatories of the Kyoto Protocol (UNFCCC, 2014) and the Convention on Biological Diversity (CBD, 2015); recognizing their vulnerability and dependency on natural resources. Many countries are in the process of regulating the requirements stipulated in the Protocol and most countries have passed specific laws for biodiversity conservation (e.g., protected areas, protection and trade of species, preservation of ecosystems, protection of genetic material), (see *Table A-2* of *Appendix B*). Roughly one-fifth of countries are members of the Climate and Clean Air Coalition (either as country signatories or non-state partners), (CCA, 2015), and half are signatories to the Minamata Convention on Mercury (UNEP, 2015b). Almost all of the countries surrounding the Caribbean are members of the Caribbean Environment Programme (UNEP, 2015a). The South American Network for Environmental Control and Compliance consists of four member states (Chile, Colombia, Ecuador and Peru), with the goals of improving regional compliance and environmental protections (OEFA, 2014). *Table 2* below contains more detailed information on important international conventions and their adoption within LAC.

Table 2 *LAC Signatories on Major International Environmental Treaties and Conventions*

Environmental Convention	*Number of LAC Signatory Countries**
Kyoto Protocol on greenhouse gasses emissions	33 of 39 (except Aruba, Cayman Islands, French Guyana, Guadalupe, Martinique, Turks and Caicos)

Convention on Biological Diversity	33 of 39 (except Aruba, Cayman Islands, French Guyana, Guadalupe, Martinique, Turks and Caicos)
Convention on the International Trade in Endangered Species of Wild Fauna and Flora (CITES)	32 of 39 (except (except Aruba, Cayman Islands, French Guyana, Guadalupe, Haiti, Martinique, Turks and Caicos))
Basel Convention on the Control of Transboundary Movements of Hazardous Waste and their Disposal	32 of 39 (except Aruba, Cayman Islands, French Guyana, Grenada, Guadalupe, Martinique, Turks and Caicos))
International Convention for the Prevention of Pollution from Ships (MARPOL)	29 of 39 (except Aruba, Cayman Islands, Costa Rica, French Guyana, Grenada, Guadalupe, Haiti, Martinique, Paraguay, Turks and Caicos)
Minamata Convention on Mercury	19 of 39 (includes Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, Guatemala, Guyana, Honudras, Jamaica, Mexico, Nicaragua, Panama, Peri, Uruguay, Venezuela)
Climate and Clean Air Coalition	7 of 39 (includes Chile, Colombia, Dominican Republic, Mexico, Paraguay, Peru and Uruguay)
Ramsar Convention on Wetlands of International Importance	28 of 39 (except Aruba, Cayman Islands, Dominica, French Guyana, Guadalupe, Guyana, Haiti, Martinique, St. Kitts and Nevis, St. Vincent and the Grenadines, Turks and Caicos)
International Labour Organization (ILO)	34 of 39 (except Cayman Islands, French Guyana, Guadalupe, Haiti, Martinique, Turks and Caicos)

Source: Basel Convention n.d.; CBD 2015; CCA 2015; CITES n.d.; IMO 2015; UN FCC 2014.
**Includes IDB's 26 LAC member countries: Argentina, Bahamas, Barbados, Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Suriname, Trinidad y Tobago, Uruguay and Venezuela and additional 13 countries that are non-IDB members: Antigua and Barbuda, Aruba, Cayman Islands, Dominica, Cuba, French Guyana, Grenada, Guadalupe, Martinique, St, Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines and Turks and Caicos.*

Concerning labor and OHS, South America in particular has seen many changes to labor law in the last 20 years (Haidar, 2009), with an uptick in the pace of legislation and enforcement of labor law within the last ten years (OIT, 2007), (see Table A-2 of *Appendix B*). This trend is parallel to the strengthening of environmental laws, as free trade agreements have promoted an increase in legislation surrounding worker health and safety (Cisneros, 2014), as well as international financing.

All LAC IDB member countries are signatories of the International Labour Organization (ILO) (ILO, 2015b), whose goals are to "promote rights at work, encourage decent employment opportunities, enhance social protection, and strengthen dialogue on work-related issues" (ILO 2015a). Most of LAC IDB member countries have adopted all eight of the Fundamental Conventions concerning the themes of forced labor, freedom of association, discrimination and child labor, while many have

adopted at least seven of these conventions[iii] (ILO, 2015d). However, the Governance (Priority) Conventions on labor inspection in general and in agriculture, employment policy and tripartite consultation have not been ratified by many countries, with the policy on labor inspection in agriculture (C129) having the smallest number of ratifications (ILO, 2015e). Ratification of the technical conventions runs from very high[iv] to very low[v] (ILO, 2015c).

3.2 NATIONAL CONTEXT

This section provides a high level overview of EHS institutional and regulatory frameworks in Brazil, Mexico and Peru. These three countries were selected due to the increased Chinese investment and given the important advancements in EHS regulations and transparency. Key highlights of the EHS institutional and regulatory frameworks are described below together with practical issues such as permitting, emissions to air and water, waste, contaminated land, occupational H&S and public health[vi]. *Appendix B* provides a summary of relevant EHS institutions/ authorities and regulations for these countries. In addition, a parallel description of the similarities and differences with Chinese regulations and permitting process is also provided.

- *Brazil* – Brazilian regulations apply at the federal/ national and state level. The Brazilian Constitution provides that, in the absence of general guidelines determined by federal laws, the states possess full authority to issue laws. The Brazilian Institute of Environment and Natural Resources (IBAMA) is responsible for enforcing the National Environmental Policy, granting federal environmental licenses to projects, controlling the use of natural resources and carrying out environmental inspections. State environmental regulators have jurisdiction over environmental matters within the state. The federal agencies IBAMA and ICMBio are also well established and active in enforcement.

  The National Environmental Council (CONAMA) is the consultative and deliberative organ of the National Environmental System (SISNAMA), which establishes standards and criteria for licensing of effective or potentially polluting activities, to be granted by the union, states, the federal district and municipalities and supervised by IBAMA. CONAMA provides for one mandatory type of audit that is specific to the oil and gas industry. Other industries need not carry out internal and independent audits. For compulsory audits, some states (Parana, Rio de Janeiro) have enacted laws that regulate compulsory audits.

[iii] Suriname has adopted the fewest of the Fundamental Conventions within LAC, with only five ratified.

[iv] Uruguay has ratified 98 of 177 technical ILO conventions.

[v] Saint Kitts and Nevis has the lowest number of ratifications for technical conventions, at 1 of 177. Trinidad and Tobago is the next lowest, at 11 of 177.

[vi] Largely referenced from www.uspracticallaw.com and verified with in-house expertise.

- *Mexico* – The General Law on Ecological Equilibrium and Environmental Protection (LGEEPA) 1988 is the primary environmental law. Through LGEEPA, Congress primarily distributes powers between the three levels of government, federal, state and municipal, and sets out overarching policies for environmental regulation, as well as the basic environmental legislation. International instruments, such as international treaties or trade agreements, are also a source of environmental law. Their influence has shaped the environmental regime and provided instruments to enforce environmental legislation.
  The Secretariat of the Environment and Natural Resources (SEMARNAT) is the main government agency in charge of enacting and enforcing environmental regulation at the federal level. Regulations to enforce environmental laws are issued by the administrative agency in charge of the relevant sector. These include regulations on hazardous waste, water, environmental audits, air emissions, natural protected areas and ecological ordinance. Environmental regulations have been also issued in the states and municipalities.
  Mexican Official Norms (NOM) are technical standards issued by the competent administrative authorities. They set out binding specifications, standards, values and characteristics applicable to any products, process, facilities, systems, activities, services or methods of production. NOMS set out maximum allowable pollutant limits for contaminants in air, water and soil, and list hazardous waste, substances, and endangered species. Additionally, there is a voluntary category of standards, known as Mexican Norms, which are mostly used to provide guidelines and criteria on technical matters.
- *Peru* – Peru has an overarching Ministry of Environment (MINAM), which coordinates the implementation of the national environmental policy with the various sectors and regional governments (i.e., states). The Environmental Assessment and Enforcement Office (OEFA), within the MINAM, plays a supervision and enforcement role for all projects. The Ministry of Health (MINSAL) has two divisions (among others) the General Direction of Public Health and the General Direction of Environmental Health, within which the Direction of Occupational Health is located.
  Beyond the overarching EHS framework, EHS regulations and management are sector-specific. The regulators set the general direction of environment affairs within each ministry (e.g., energy and mines, transport and communication, agriculture, etc.) that regulates EHS issues to the companies and projects within their sector, including approval of EIAs. Other EHS regulations are applicable across the sectors and include specific permits, such as those for water use, water quality, deforestation, and biodiversity conservation. There are specific municipal regulations mostly associated with zoning and waste management. Regulators have a strong focus on promoting compliance with environmental requirements, especially by investors in, or sponsors of, major projects. Sanctions and corrective measures can be imposed on companies or individuals, as per the General Environmental Law (GEL).

Box 5 *Chinese Institutional and Regulatory Framework*

China – Various government-level organizations (i.e., ministries, administrations, etc.) are established under the State Council, and assigned responsibilities for general management (within their jurisdiction) for the whole country. Ministries and national-level Administrations have devolved the majority of their authority to their Bureaus at provincial and local levels. Provincial EHS regulations (e.g. specific permitting requirements, discharge thresholds, etc.) are aligned with the national laws, regulations and standards, provide guidance on their local implementation and impose stringent requirements.

The National Development and Reform Commission (NDRC) and local Development and Reform Commissions are responsible for overall project approval. The Ministry of Environmental Protection (MEP) is responsible for EIA approval and Completion Acceptance Inspection (CAI) approval for environmental protection equipment. The State Administration of Work Safety (SAWS) is responsible for OHS pre-approvals, Completion Acceptance Inspection approval and monitoring. The Ministry of Human Resources and Social Security (MOHRSS) is responsible for occupational injuries insurance. The Ministry of Health enacts occupational health laws, regulations and standards, and oversees the definition and implementation of public health laws, regulations and programs.

The Ministry of Public Security oversees the firefighting design approval and CAI of firefighting equipment. The Ministry of Water Resources is responsible for permitting water and soil conservation plans and water abstraction permitting. The Ministry of Land and Resources is in charge of land acquisition permitting. The State Forestry Administrative reviews and examines forested land acquisition. All national level commissions, ministries and administrations have local representation at provincial and local levels, with authority to permit projects up to certain scales, and are responsible of enforcement of national and local requirements.

All three countries require an EIA or an environmental and social impact assessment (ESIA) to assess the environmental and social impacts of projects; the EIA forms the basis of the permitting process of a project. Further regulation stipulates what types and magnitude of projects require an EIA (Tiffer-Sotomayer, 2015). Generally, a project's level of impact determines its category and thus the requirements for the EIA permitting. In most countries, the health and safety impacts are included in the ESIA process and ESIA document as part of a risk assessment.

The labor and working condition requirements are typically enforced by the corresponding agencies and are outside of the main environmental permit. In addition to the main EIA, various other EHS permits are typically required, depending on sector, location and magnitude of the project. These could include natural resources use or extraction; land use change; construction in water courses; air emissions or effluents discharge; waste treatment and disposal; material acquisition, use, and handling; tree cutting; and working near or within sensitive areas (protected areas, indigenous people's land)[vii]. Permits can be regulated and issued at the central, state or municipal level and can vary by sector

[vii] This does not include social and cultural heritage permits.

and project magnitude. In general, the EHS permitting procedures in the countries differ, and can take a considerable amount of time to obtain before the start of a project (Kadas and Fraker, 2014).

The holder of the environmental permit is typically the project sponsor, who becomes legally responsible and accountable for the project's compliance with local EHS regulations and the specific requirements in the environmental permit. Most commonly, EHS commitments and requirements are passed on from the project sponsor to the EPC contractor through specific clauses in the EPC contract agreement; however, the project sponsor remains accountable before the authorities. The EPC contractor further develops the plans and programs that will be used to implement the EHS requirements for the project and the Project Sponsor undertakes the review, approval, oversight and inspection of the EPC Contractor's EHS performance of the project.

All of the environmental and labor safety ministries of the three focus countries have dedicated agencies with a supervision and enforcement mandate – for instance, Brazil has the Institute of the Environment and Renewable Natural Resources (IBAMA), Mexico has the Federal Attorney for Environmental Protection (PROFEPA), and Peru has the Agency for Environmental Evaluation and Audit (OEFA).

- *Brazil* - The environmental licensing procedure usually depends on both sectoral rules and specific state or municipal regulations, due to the concurrent jurisdiction of public agencies over environmental matters. A state government has jurisdiction over the licensing of facilities to be built within its territory, unless the environmental impact extends beyond its borders, when the federal government has jurisdiction. In addition, municipalities have jurisdiction to license enterprises whose impact is merely local. In addition to the general guidelines established by the federal government, each state has authority to regulate environmental licensing procedures occurring within its borders. Environmental legislation may require separate permits for specific activities which have different impacts but are related to the main activity (e.g. separate permits for deforestation and waste transportation). The licensing procedure of certain activities deemed to significantly impact on the environment requires an EIA and the corresponding environmental impact statement (*Relatório de Impacto Ambiental* - RIMA). The EIA and RIMA must both be submitted for approval to the appropriate authorities.
- *Mexico* – At the federal level, EIAs are required when the project has an implied environmental risk or is in environmentally sensitive areas and falls under review of the Ministry of the Environment (SEMARNAT). This is included within the process to obtain an Integrated Environmental Licence (LAU), which covers federally-regulated sources of emissions for air, water and hazardous waste. State legislatures regulate the activities requiring an EIA that fall outside of federal jurisdiction. Even though such EIAs do not fall under the oversight of SEMARNAT, they are often the prerequisites for local environmental permits. While some states have their own

LAU, other states do not have such an integrated system, and individual environmental permits and licences must be obtained. In some cases, separate municipal permits are also necessary, depending on local law and environmental sensitivity.

- *Peru* – Public or private investment projects that pose negative environmental impacts are required to prepare an EIA to be approved by the corresponding sectoral authority. Based on the environmental risks, projects are classified as Category I, II or III, requiring an environmental impact statement (*Declaración de Impacto Ambiental* – DIA); semi-detailed EIA (EIAsd) and detailed EIA (EIAd), respectively. In addition, companies must apply for separate permits from the authorities in charge of the specific activities (e.g., forest clearing, quarry exploitation, water use permit, cultural heritage permit, etc.). The OEFA supervises EIAs approved by the environmental authorities of the different government sectors. Law 30327 (May 21, 2015) establishes for the National Service of Environmental Certification for Sustainable Investment (SENACE) to implement an integrated permitting regime, whereby the various permits and authorizations that are required for the development of Category III investment projects, including the EIAd, will be progressively incorporated into a single permit proceeding denominated "Global Environmental Certification". This will include some specifically listed permits; however, other permits that are not included in the scope of Law 30327 must be obtained independently.

Box 6 *Chinese Permitting Process*

In China, project EHS is managed by the so called “3 synchronies” approach, where projects are required to be designed, constructed and operated simultaneously with the design, construction and operation of EHS installations and management practices. This approach covers all aspects of EHS. EHS assessments, including EIA, Safety Assessment (SA), Occupational Disease Hazards Assessment (ODHA) and firefighting design, need to be undertaken and approved by the relevant authorities prior to project construction. Prior to the EIA approval, additional topical assessment may be needed depending on the characteristics and the location of the project; this could be completed with the EIA in an integrated manner. Such assessment usually includes a Water Resources Assessment for direct water abstraction and a Water and Soil Conservation Plan to manage erosion.

During construction, the authorities will ensure compliance of design and construction of? the permitted project through the supervision work conducted by licensed third parties appointed by the investor or EPC contractor.

Once a project commences trial operation and before engaging in full production, the operator bears the responsibility to operate the project according to the approved initial assessments. If he fulfils this requirement a Completion Acceptance Inspection permit is issued by the relevant authorities within 6 months from commissioning. In selected provincial jurisdictions, emission discharge permits are then issued by the environmental authorities which oversee operational performances.

Should modification or expansion occur, the “3 synchronies” process is triggered for the operator to undergo the permitting process once again.

Table 3 provides a broad overview of the commonalities and differences between management practices, legislation, and permitting for EHS between the focus countries and China. *Appendix B* provides more detailed information for the three focus countries, including a list of the EHS regulatory authorities (Table A-1); summary of key authorities, legislation and permitting requirements (Table A-2) and a list of key EHS regulations (Table A-3).

Box 7 EHS Framework for Outbound Chinese Investments

For Chinese outbound investment and Chinese international contractors where project locations are overseas, the Ministry of Commerce, jointly with the Ministry of Environmental Protection, issued the *Guidance on Environmental Protection for Outbound Investment and Cooperation*, which contains general EHS recommendation for overseas projects. The basic concept of this *Guidance* is completing necessary EHS and social assessments and permitting requirements according to the local laws and regulations, and encouraging the adoption of good international practices promoted by international organizations and financing institutes. The *Guidance* also encourages due diligence completed for merger and acquisition activities.

The China International Contractors Association also published a *Guide on Social Responsibility for Chinese International Contractors (2012)* detailing the recommended approach and measures dealing with environmental, health, safety, security, social and community issues abroad. The *Guide* is formulated reflecting general principles and practices as embedded in the United Nations Global Compact and ISO 26000 Guidance on Social Responsibility; it also summarizes and incorporates recent industry best practices and enshrines the common understanding of the Chinese international contracting industry towards social responsibility.

China has lately undertaken research on green finance to ensure sustainable development. The China Banking Association established a green financing committee in November 2014 to promote Chinese Banks' commitment and capacity in environmental and social sustainability gradually benchmarking against international standards and practices. It aims at supporting Chinese Banks to adopt environmental and social sustainability polices and management systems and diverting finance to environmental and social sustainable projects and enterprises.

Other relevant guidelines and requirements are listed in *Appendix C*.

Table 3 Key Characteristics of EHS Regulatory Structure of LAC Focus Countries and China

	Environment	Brazil	Mexico	Peru	China
Government Authorities	Central-level [Federal] environmental regulatory ministry or secretariat	✓	✓	✓	✓
	Local environmental protection agencies	✓			✓
	Sub-agencies with specific environmental focus (e.g. water, forestry)	✓	✓	✓	✓
	Sector-specific government agencies or ministries (e.g. mining or energy)	✓		✓	✓
	Enforcement agencies	✓	✓	✓	✓
Legislation & Regulation	Overarching national environmental policy	✓	✓	✓	✓
	Emissions limits and controls	✓	✓	✓	✓
	Environmental standard parameters (e.g., water quality, air quality, soil quality)	✓	✓	✓	✓
	Sector-specific environmental regulations	✓	✓	✓	✓
	National waste policies (liquid, solid and hazardous)	✓	✓	✓	✓
	Natural protected areas and biodiversity conservation	✓	✓	✓	✓
	Requirements established in the approval of the environmental impact assessment	✓	✓	✓	✓
	Water quality legislation	✓	✓	✓	✓
Permitting	Core environmental permitting process (e.g., EIA permit)	✓	✓	✓	✓
	Sector-specific permits (e.g., water use, effluents, deforestation, waste management and disposal, quarries, etc.)	✓	✓	✓	✓
	Occupational Health and Safety	**Brazil**	**Mexico**	**Peru**	**China**
Government Authorities	Central-level labor regulatory ministry or secretariat	✓	✓	✓	✓
	Local OHS agencies				✓
	Sub-agencies with specific labor focus (e.g. worker health)	✓	✓	✓	✓
	Sector-specific government agencies or ministries (e.g. mining or energy)	✓		✓	
	Enforcement agencies	✓	✓	✓	✓
Legislation & Regulation	National law on OHS		✓	✓	✓
	Sector-specific regulation and standards for OHS	✓	✓	✓	✓
	Stringent legislation for workers' rights	✓		✓	✓
	Stringent legislation, regulation, and norms for worker safety	✓	✓	✓	✓
	Community Health and Safety	**Brazil**	**Mexico**	**Peru**	**China**
Government Authorities	Central health & safety regulatory ministry or secretariat	✓	✓	✓	✓
	Sub-agencies with specific CHS focus (e.g. community health)	✓	✓	✓	
	Sector-specific government agencies or ministries (e.g. mining or energy)				
Legislation & Regulation	National policy for CHS	✓		✓	
	Regulation on environmental quality affecting community health and safety	✓	✓	✓	✓

4.0 REVIEW OF INTERNATIONAL GOOD EHS MANAGEMENT STANDARDS AND PRACTICES

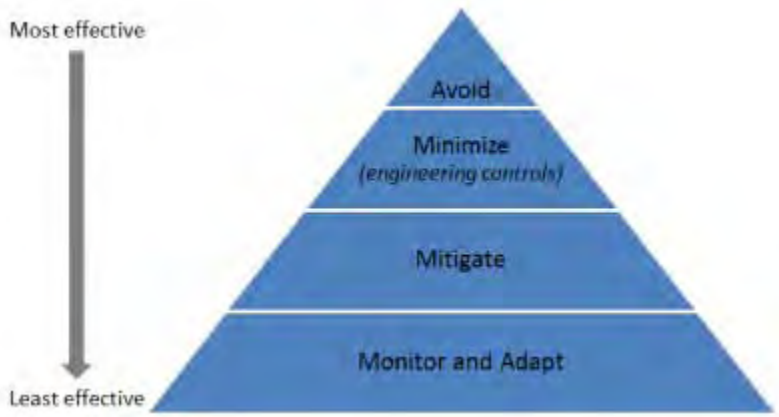
This Section provides a practical overview of international good practice drawing from the IDB Environmental and Social Safeguards, World Bank Group EHS Guidelines, IFC Performance Standards, and other international and Chinese resources (see *Appendix C*).

The Section is structured into three sub-sections: environment, occupational health and safety (OHS), and community health and safety. The focus of the Section is the construction phase of project activities in the following key sectors: mining, oil and gas, agribusiness, and infrastructure. Each sub-section includes a discussion around the rationale for controlling and managing risks and impacts; specific key risks and impacts associated with each aspect during construction; and a description of best practice mitigation measures. Case studies provide concrete examples of particular experiences, challenges, and opportunities.

Risks and impacts need to first be identified and understood to be effectively and adequately mitigated and managed. Risk and impact identification and assessment typically occurs during the ESIA process, regulated by national legislation (see Section 3), and commonly at the same time as the feasibility and engineering studies are being conducted. Best practice calls for risks and impacts identification to be done as early as possible in the project cycle so that any required mitigation and management measures can be incorporated into the project site selection, design and engineering process, and project permits and authorizations.

Mitigation measures should fit within the framework of a management system that follows the Plan–Do–Check–Act (PDCA) model. While management systems are discussed in more detail in Section 5, they should, as a minimum, aim for compliance with local regulations and reflect the involvement and responsibilities of the developer and subcontractors. International best practice indicates that the specific measures within a management system should follow the mitigation hierarchy, as seen below in *Figure 1*.

Figure 1 Mitigation Hierarchy



Source: Adapted from OSHA.

These measures range in effectiveness to dealing with risks:

- Avoid and minimize: Includes both elimination or substitution of unnecessarily risky project components, and development of control measures embedded in the project's design, construction, and operation that 'change' the project to avoid/prevent the impact.
- Mitigate: Includes other non-engineering or design measures that are put in place to reduce and permanently control the impact (e.g., sound barriers to mitigate noise impact).
- Monitor and Adapt: Ongoing process to track and validate that the previous measures are in place and meeting the standards based on established indicators or to determine whether any of the measures need to be adapted or changed to properly mitigate the impacts.

This Technical Note focuses primarily on avoidance and minimization as well as mitigation and monitoring of risks via management and administrative controls. Beyond this Section, *Appendix C* provides a list of references and resources including guidance on EHS practices for outbound investment by Chinese authorities, international finance institutions, and industry associations.

Box 8 EHS and Social/Community Management Standards: China vs. International

Chinese EHS regulations and standards generally follow the same principles as the international standards and guidelines (such as ASTM and ISO standards often referred to in Chinese guidelines) and adopt the *'Avoid and Minimize, Mitigate, Monitor and Adapt'* hierarchy. Environmental protection and OHS are considered in the project design while additional mitigation measures and management plans are developed as part of the various topical regulatory assessments such as EIA, safety assessment, occupational disease hazards assessment, water and soil conservation plan, water resources assessment. By complying with Chinese regulations and standards, partial alignment with general international guidelines (such as IFC General EHS Guideline) can be achieved, although not in the form of an integrated assessment resulting in a combined Environmental (Health & Safety) and Social Management Plan for all phases of the Project.

Chinese regulatory requirements on social and community management are relatively weak with only general principles touched upon such as 'avoid disturbance to community', 'safety distance' and 'public notification'. Key

gaps between the Chinese standards and the international practices include:

- Social impact assessment;
- Free, prior and informed consent (with Indigenous People);
- Community grievance mechanism;
- Community disturbance, safety, security and emergency planning.

In recent years, Chinese legislation has placed greater emphasis on social and community management by the promulgation of the new *Environmental Protection Law (2015)*, the *Project Environmental Impact Assessment Public Disclosure Guidance (Trial) (2013)*, and the requirements of Social Stability Risk Assessment for major projects. It is foreseeable that Chinese social and community management standards will gradually further align with international best practices.

4.1 ENVIRONMENTAL

Environmental risks and impacts are inherent to the activities associated with the construction phase of projects, especially in the mining, oil and gas, and infrastructure sectors, and include issues such as water and energy supply, emissions to air and waterbodies, waste generation, soil erosion and contamination and management of hazardous wastes. In addition, impacts to terrestrial and aquatic habitats are also an issue for projects under construction. Environmental risks are not insurmountable, but may be challenging and high profile and if not effectively managed, can affect schedule, profitability, and reputation.

The International Finance Corporation (IFC) Environmental and Social Management System (ESMS) Implementation Handbook for Construction (IFC, 2014) notes several examples of the benefits of correctly managing environmental risks and impacts, including:

- Conserving and using energy and materials efficiently can reduce construction costs,
- Managing surface run-off and run-on to control erosion avoids schedule delays and the risk of fines,
- Recycling building waste from demolition can reduce the increasingly expensive cost of disposal in landfills and other waste facilities.

Controlling and managing environmental risks and impacts during construction also helps: ensure compliance with regulatory and contractual requirements; minimize disturbed areas; minimize costs of water use and water treatment needs; prevent noise and vibration nuisance; protect surface and groundwater quality; preserve biodiversity; minimize fees from waste disposal; prevent the creation of liabilities from soil or water contamination and clean-up costs; prevent fines and delays in construction; protect the health and safety of employees and cost of lawsuits and/or work stoppages and protect the general public from unsafe conditions. Additionally, it also avoids significantly affecting natural resources used by local communities and therefore preventing social conflict.

See *Appendix A*, Case Studies on Environmental Management: ***Ethylene XXI, Mexico*** and ***Jaguar Energy, Guatemala***

4.1.1 Soil Erosion and Sediment Control

Key Risks and Impacts

Erosion is the destabilization and removal of soil caused by various anthropogenic and natural drivers such as deforestation, earth movement, wind, rain, snow, river flow, which can result in fine and coarse sediments mobilizing and transporting to downslope areas. Sediments can be a significant pollutant due to their own physical and chemical characteristics (e.g. increase in turbidity) as well as the potential to carry other pollutants such as pesticides and trace metals. Sediment transport can affect the water quality of receiving water bodies, downslope vegetation communities and their ecosystem. The potential for erosion and sediment transport is greatest during construction when vegetation cover is removed and soils and subsoils are exposed. Table 4-1 presents a summary of project actions and their resulting risk and impact. International good practice typically covers erosion (source) and sediment transport (conveyance) control measures.

Table 4-1 Key Risks and Impacts Associated with Erosion and Sediment Transport

Project Actions	Potential Risk or Impact
• Land/vegetation clearing • Top soil removal • Earth movement, grading, and excavations for the construction of project facilities including roads, transmission lines and other linear components • River diversions (temporary or permanent) • Offroad driving • Blasting activities	• Increase in soil erosion • Sediment transport and mobilization • Loss of soil • Destabilization and slumping that could result in landslides and ground subsidence • Scouring of riverbed • Change in water quality of downstream water bodies • Disturbance of downslope vegetation habitat

Good Practice to Avoid and Minimize, Mitigate, and Monitor Erosion and Sediment Transport

Avoid and Minimize

- Limit vegetation clearing to the approved areas. Clearly demarcate the approved areas to avoid impacting additional areas and clear areas following the construction schedule to minimize soil exposure.
- To the extent possible, avoid earth movement activities during heavy rains or high winds, especially on steep sloped areas.
- Ensure slope gradients are consistent with appropriate geotechnical stability to avoid erosion. Consider contouring and minimizing lengths.

- Avoid locating permanent and temporary project facilities on or near hydrological features such as rivers, streams, springs, lakes, and ponds.
- Design and implement erosion control structures that minimize source release: exposed soil surface stabilization (e.g., mulch, geomembranes, hydroseeding), wind shields, riprap on shore/stream banks, terraces, drainage systems, and water diversion structures. Consider hydrological conditions for the design of such structures (at least the 25-year/24-hour event for temporary and 100-year/24-hour event for permanent structures).
- Design adequate riverbank and energy dissipation protection (e.g., riprap) when construction is close to water bodies or involves river diversion.

Mitigate

- Develop and implement a soil erosion and sediment control plan.
- Develop and implement a contingency plan that includes large-scale erosion events such as landslides and ground subsidence.
- Continuously maintain erosion and sediment control structures.
- Provide continuous training on soil erosion and sediment control measures and plans to all construction personnel.
- In areas where erosion is unavoidable, design and implement sediment control structures to minimize the conveyance of sediment transport: silt fences, sedimentation basins, check dams. Consider hydrological conditions for their design, as indicated above.
- To decrease time of exposed soil surfaces, progressively revegatate and stabilize disturbed areas where further activity is no longer planned.
- Adequately salvage and store topsoil for revegetation activities. Replace topsoil considering the existing geomorphology and topography and grade and re-contour to ensure proper drainage.

Monitor

- Monitor and inspect slope and geotechnical stability and erosion and sediment control structures.
- Monitor water quality, especially turbidity and suspended solids, in downstream receiving water bodies.
- Monitor revegetated areas for key indicators such as plant cover, density and species richness of native vegetation.

4.1.2 Water Use and Water Quality

Key Risks and Impacts

Construction activities could greatly affect surface and groundwater resources, both their volume and quality. Construction typically requires water that is extracted from local sources, which could affect downstream water availability and subsequently local users. Erosion and sediments transported to nearby water bodies could affect their quality, especially related to suspended solids and pollutants carried by sediments such as pesticides and trace metals. Hazardous substances used and solid wastes and effluents generated during construction can

pollute water bodies. Construction of structures in streams or diversion structures could remove riverbed material and temporarily affect the downstream water quality, impacting aquatic habitats. *Table 4-2* presents a summary of project actions and their resulting risk and impact.

Table 4-2 Key Risks and Impacts Associated with Water Use and Water Quality

Project Action	Potential Risk or Impact
Project actions that could impact surface water include: • Vegetation clearing and earth movement • Extraction of water for construction use • Construction of structures in stream or river bed (e.g., bridges, dams) or channel diversion structures • Wastewater discharge (domestic and industrial) • Transportation and handling of hazardous materials and solid waste	Surface water: • Change in surface drainage patterns • Change in stream flow and downstream water availability • Change in surface water quality • Contamination from runoff, leachate, discharge, or spills
Project actions that could impact groundwater include: • Conversion of land to impervious areas • Extraction of groundwater for construction use • Drilling and excavation • Effluent discharge to groundwater • Transportation and handling of hazardous materials and solid waste	Groundwater: • Decrease in groundwater recharge • Decrease in water table level • Change in groundwater quality • Contamination from infiltration or aquifer interaction

Good Practice to Avoid and Minimize, Mitigate, and Monitor Water Use and Water Quality

Apply measures indicted in Sections 4.1.1, *Soil Erosion and Sediment Control*; 4.1.5, *Solid and Hazardous Waste*; and 4.1.6, *Contaminated Land and Groundwater*. In addition:

Avoid and Minimize

- When identifying water extraction sources, consider hydrological or hydrogeological conditions and existing water uses and services (e.g., community domestic uses, irrigation, ecosystem habitat).
- Evaluate other sources of water supply if local water sources are scarce.

- Design and implement waste water treatment facilities that are properly dimensioned and designed to treat the pollutants found in the effluents.
- Treat wastewater to meet sector specific national and international standards before discharging to a receiving water body. Consider capacity, water quality and uses of receiving water body, and presence of sensitive aquatic species or habitats.
- Separate surface runoff from wastewater to reduce treatment volume.
- Separate domestic wastewater from industrial wastewater as treatment techniques could differ in complexity, process, and cost.
- Avoid contact of surface runoff with potential sources of contamination and wasterock, especially rock with potential to produce acid drainage.
- Capture and filter (through sedimentation ponds) initial surface runoff during rain events before discharge (at least for initial period ≈20min)
- Promote water use efficiency and conservation: minimize water use and wastewater generation, recycle wastewater, and use non-contact surface runoff as a source for construction water needs or groundwater recharge.
- To the extent possible, limit in-stream construction activities to low flow periods. Use isolated techniques to limit exposure of sediments to moving water.
- Avoid locating permanent and temporary project facilities on or near hydrological features such as rivers, streams, springs, lakes, and ponds.
- When drilling or testing wells, identify aquifer location and conditions and use biodegradable (e.g., environmentally friendly) additives.
- Avoid salinity intrusion (e.g., mixing of saltwater with freshwater) by managing groundwater pumping near coastal shoreline.

Mitigate

- Provide adequate portable or permanent sanitation facilities to workers.
- Develop and implement a spill contingency plan.
- Provide continuous training on water management measures and plans to all construction personnel.
- Stop any unauthorized discharges to water bodies as soon as identified.

Monitor

- Continuously monitor flow upstream and downstream of project area and construction water sources, comparing result with baseline flows.
- Continuously monitor water quality upstream and downstream of project area, comparing results with baseline water quality.
- Monitor water quality of treated effluents at the discharge point and compare against local and international standards.

- If required, install groundwater wells and continuously monitor groundwater levels and quality of aquifers potentially affected by project construction activities.
- Monitor infrastructure with direct intervention of water bodies, such as river crossings, bridges, siphons, culverts, discharge points, river diversions.
- Develop and implement a grievance mechanism to receive and respond to local complaints of nearby Affected Communities.

4.1.3 Noise and Vibration

Key Risks and Impacts

The operation of construction equipment including pile drivers, blasting, tunneling, earth moving / excavation equipment, concrete mixers, generators, and cranes, and the transportation of equipment, materials, and people all can generate noise and vibration. Health effects on workers and local communities from noise and vibration are covered in *Sections 4.2 and 4.3*.

Table 4-3 Key Risks and Impacts Associated with Noise and Vibration

Project Action	Potential Risk or Impact
Project activities that increase noise and vibration: • Civil works • Earth work movement • Vegetation clearing and removal • Dynamiting / blasting • Tunneling/ drilling • Pile driving • Equipment operation • Equipment transportation and installation • Vehicle traffic	• Increase noise levels above ambient conditions is a risk to the health of workers and the community, may be regarded as a nuisance and source of conflict with communities and may negatively impact biodiversity. • Vibrations could affect existing infrastructure, potentially jeopardizing its stability and be a risk to the health of workers and the community. • Conditions, that if present, can increase/decrease the impacts: o Vehicle and equipment maintenance and speed of operation o Night time activities, in particular blasting and pile driving o Activities, blasting in particular, during unfavorable atmospheric conditions, such as low level inversions o Improper equipment selection and engineering controls

Good Practice to Avoid and Minimize, Mitigate, and Monitor Noise and Vibration

Noise control measures should be applied at the source of the impact to align with the suggested maximum noise levels (see Table 4-4) at the location of sensitive receptors, such as residential communities. In the event where the suggested maximum noise levels already exceed

background noise levels (collected through baseline monitoring), project activities should not result in an increase of more than 3 decibels (dB) at the nearest off-site receptor location.

Table 4-4 Suggested Maximum Noise Levels (One hour Leq, dBA)

Receptor	Daytime	Nighttime
Residential, institutional, educational (includes rural areas)	55	45
Industrial, commercial	70	70

Source: World Bank Group, General EHS Guidelines (2007).

Avoid and Minimize

- Locate the project to maximize distance from receptors and use of topography to block noise, to the extent possible.
- Re-locate activities to less sensitive areas, as needed, to take advantage of distance and shielding.
- Route construction traffic away from receptors.
- Select equipment that generates lower noise levels, including equipment with electric motors rather than diesel engines.
- Install silencers for fans, mufflers on exhausts and compressors, acoustic enclosures (e.g. cages and guards) for noisy equipment and/or noise barriers.

Mitigate

- Develop and implement a preventive maintenance schedule for all heavy construction equipment and machinery.
- Provide appropriate training to workers for proper operation of vehicles and construction equipment and minimize unnecessary idling.
- Develop and implement a noise and vibration management plan.
- Plan flight routes, timing and altitude for aircraft flying over the project area.

Monitor

- Develop a noise model by trained specialists to understand the noise dispersion impacts.
- Monitor ambient noise and noise from activities near key receptors. Use noise monitors to log data over a 48-hour consecutive or cumulative period that spans both week days and weekend workdays. Noise monitors should be located 1.5 m above the ground and at least 3 m away from any reflecting surface such as a wall.
- Where necessary and possible, hire a noise expert to establish acoustic indices, depending on type of noise being monitored.
- Develop and implement a grievance mechanism to receive and respond to local complaints of nearby affected communities.

4.1.4 Dust and Air Quality

Key Risks and Impacts

Construction of infrastructure and associated facilities (including work camps, access roads, and maintenance roads) generates temporary and

localized increases in dust and fuel combustion emissions. These emissions can have impacts at multiple scales (local, regional, and transboundary). Of particular concern is the impact of dust and pollutants (i.e., Sulfur Oxides (SOx), Nitrogen Oxides (NOx), Carbon Monoxide (CO), and Particulate Matter (PM)) as a risk to human health. Such airborne pollutants can suffocate stomata (cells that protect plants) and disturb fauna, or have indirect impacts via soil pollution. GHG emissions represent a transboundary risk due to the impacts on climate change.[viii] Activities that release air pollutants and dust are summarized in Table 4-5.

Table 4-5 Key Risks and Impacts Associated with Dust and Air Quality

Project Action	Potential Risk or Impact
Fuel combustion emissions will be emitted from exhausts of road and non-road compression-ignition engines. Fuel combustion from any number of sources including: • Road vehicles • Construction equipment • Generators • Compressors • Top soil disturbance, blasting, and transportation of loose material	• Respiratory tract infections or disease in workers, nearby community and fauna • Contribution to global warming from GHG emissions
Dust is generated as a function of the construction activity type, soil type, moisture content, wind speed, precipitation frequency, vehicle traffic, vehicle type, and roadway characteristics. Dust emissions are greater during drier periods and in areas of finer-textured soils. • Vehicles moving over unpaved surfaces or emitting dust from their wheel wells or cargo • Dust from associated facilities such as concrete plants, quarries or soil piles.	• Respiratory tract infections or disease in in workers, nearby community and fauna • Affected health and wellbeing of workers and nearby community • Lower air quality due to suspended dust in air and reduced visibility • Suffocated stomata in vegetation

Good Practice to Avoid and Minimize, Mitigate, and Monitor Dust and Air Quality

Avoid and Minimize

[viii] While GHG emissions are not addressed in more detail here, according to industry good practice, projects that are expected to produce more than 25,000 tonnes of carbon dioxide equivalents (CO2e) annually during construction and/or operation should quantify direct emissions from the facilities owned or controlled within their physical project boundary, as well as indirect emissions associated with offsite energy production used by their project.

- Suspend earthworks and other activities which may generate dust on dry and windy days.
- Identify and avoid all non-necessary movement of equipment and machinery.
- Design transport routes for construction vehicles and intermediate storage areas to maximize efficiency and minimize transportation distances.
- Avoid multiple transfer points to consolidate the activities in one location where it can be managed efficiently.
- Use pre-fabricated aggregates rather than sand or gravel, where possible.
- Avoid burning non-vegetative waste at construction sites.
- Prohibit off-road driving outside designated areas and impose speed limits for all vehicles.
- Cover loads on all vehicles and use enclosed conveyors and belt transport instead of hauling material by trucks.
- Install dust screens around activities that generate excess dust emissions (e.g. crushing).
- Dampen or spray water (where adequate supply is available) or appropriate surface treatment (e.g. calcium chloride) on stockpiles, work areas, and roads.
- Consider erosion control measures presented in Section 4.1.1 to avoid wind erosion and dust resuspension.
- Select equipment and machinery (e.g., combustion engines) that are most efficient and reduce GHG emissions.
- Quantify GHG emissions for the construction phase. If GHG emissions exceed 25,000 tons CO2eq/ year, evaluate alternatives that reduce such emissions.

Mitigate

- Develop and implement maintenance schedule for all heavy construction equipment, machinery and light vehicles in line with manufacturers specifications to minimize air emissions.
- Exposed soil in work areas no longer in use should be promptly revegetated to control dust emission.
- Provide appropriate training to workers for proper operation of vehicles and construction equipment and minimize unnecessary idling.

Monitor

- Where required by local or international regulations and technology is available, monitor ambient air quality program at the closest human receptors. This should include monitoring of PM10, PM2.5, NOx, SO2, and CO and Volatile Organic Carbons (VOCs).
- Implement an ambient air monitoring program at the closest sensitive ecological habitats to monitor NOx and SO2.
- Perform regular visible dust emission checks on all active work fronts, dry excavation sites, stockpiles, and material transfer points.
- Monitor the use of dust suppressants for roads and work fronts.
- If GHG emissions exceed 25,000 tons CO2eq/ year, quantify such emissions on an annual basis.

4.1.5 Solid and Hazardous Waste

Solid waste is any solid material that is being discarded by disposal, recycling, burning or incineration. The section is split into three parts: first general principles for managing waste are discussed. Then, specific practices for solid waste are discussed in Section 4.1.5.2 and those for hazardous waste materials are discussed in Section 4.1.5.3.

Key Risks and Impacts

Table 4-6 Key Risks and Impacts Associated with Solid Waste

Project Action	Potential Risk or Impact
• Construction of temporary facilities • Packaging of equipment and materials • Operation of temporary domestic facilities, such as kitchens, accommodation areas, offices, and maintenance areas	• Contamination of soil and water resources • Visual impacts to construction areas • Attraction of vector-borne diseases • Impacts to human health • Nuisance odors in surrounding areas • Unnecessary overburdening of landfills

Good Practice to Avoid and Minimize, Mitigate, and Monitor Wastes

There are several principles for managing waste that apply to both solid and hazardous wastes, as summarized in Table 4-7.

Table 4-7 Approaches for Managing Solid and Hazardous Waste

<table>
<tr><th>Solid Waste</th><th>Hazardous Waste</th></tr>
<tr><td colspan="2">Common approaches:
• Apply waste management hierarchy and priorities
• Minimize at source, control acquisition of materials and other products
• Segregate by type of category (solid versus hazardous) as well as by sub-category (e.g. plastics vs. scrap metal)
• Signage of collection and storage facilities
• Reuse, where possible and contract recycling companies
• Transport and dispose of in appropriate facilities, in compliance with local regulations
• Train relevant personnel for waste management from generation to final disposal</td></tr>
<tr><td>Specific approaches:
• Recycle
• Recover
• Dispose at municipal disposal or certified landfill</td><td>Specific approaches:
• Appropriate labeling as per international standards
• Signage and adequate temporary storage
• Provide trainings on hazardous waste to relevant personnel
• Transportation and handling by certified company
• Certification of disposal in secured landfill</td></tr>
</table>

4.1.5.1 General

Avoid and Minimize

- Establish a waste management hierarchy that considers: prevention, reduction, reuse, recovery, recycling, removal, and disposal of wastes.
- Identify waste sources, collect data and information on generation, and establish priorities across the waste cycle.
- Prevent waste generation by substituting raw materials and inputs; prioritize manufacturing processes that use materials efficiently; and apply good operating practices to avoid out-of-date or excess materials.
- Select providers that demonstrate good waste management and packaging practices.
- Prohibit on-site burning of waste materials.

Mitigate

- Clearly label waste storage containers and locations by type of waste. Waste containers should be appropriate to avoid spills and leakage. Drums, bins, receptacles, and dumpsters used for storage should be selected based on waste material requirements, prevention of wildlife attraction (steel or heavy-duty plastic containers), and transport requirement (truck, forklift). Provide secondary containment if necessary.
- Prevent run-off water contamination by waste stored in open areas.
- Segregate waste by type so as to prevent cross-contamination.
- Handle and transport waste with appropriate equipment and vehicles or through certified third parties.
- Dispose of generated waste in on-site or off-site treatment or disposal facilities specially designed for such activity such as permitted landfills, incinerators, and composting facilities.
- Train workers on the correct transfer and handling of waste.
- Schedule removal of waste from temporary storage areas at appropriate intervals.

Monitor

- Keep a waste register to record the quantity of wastes generated, locations, time of storage, risk category (hazardous or non-hazardous), disposal methods, details of contractors and vendors, and quantities of wasted recycled, or sent to landfill. The reduction of material consumption (through waste minimization initiatives) should also be recorded.
- Request and record receipts or other confirmation that recyclables and wastes were disposed of at approved facilities by certified third parties.

4.1.5.2 Solid Waste

Solid, non-hazardous wastes include garbage or refuse generated by construction activities or worker camps. Table 4-8 provides waste types and their typical disposal route. Wastewater and hazardous wastes are covered in Section 4.1.2 and Section **Error! Reference source not ound.**, respectively.

Table 4-8 Types of Solid Waste and their Suggested Routes

Category	Types of Waste	Typical Waste Disposal Route
Industrial	Wood/timber, metal scraps, concrete, drums, and uncontaminated soil, mud, rock/stone (including from dredging and tunneling)	• *Recycled*: metal scraps, plastics • *Landfill*: concrete, uncontaminated soil and mud • *Reuse*: drum, wood, scrap metal, uncontaminated water, rock and soil
Domestic	Paper, plastic, glass, cans, packaging, and food wastes	• *Recycled*: paper, plastic, glass, cans, packaging • *Landfill*: food wastes

Avoid and Minimize

Refer to general measures discussed in Section 4.1.5.1.

Mitigate

- Identify and prioritize procurement of materials that can be reused or recycled.
- Reuse any salvageable and practical waste materials.
- Consult with the local community on the demand for any recyclable materials such as plastics, glass, scrap metal, cardboard, or wood, which may have a value or use locally.
- Collect and sort all recycled items at the source into separate colored and clearly marked bins or containment instruments, before transport to recycling centers.
- Some waste material may be utilized for energy recovery through incineration. Prohibit on-site burning of waste materials.

Monitor

Refer to general measures discussed in Section 4.1.5.1.

4.1.5.3 Hazardous Waste

Hazardous waste have characteristics such as ignitability, corrosion, reactivity, toxicity, or other physical, chemical, or biological characteristics (see Table 4-9) that may pose a potential risk to human health or the environment if not properly managed.

Table 4-9 Types of Hazardous Waste and Suggested Disposal Routes

Category	Types of Waste	Typical Waste Disposal Route
Industrial	Fuels, oils, solvents, paint, spent oil/chemical/ pesticide containers, asbestos containing materials (ACM), polychlorinated biphenyl (PCB) containing oils (often found in transformers), and contaminated water	• *Recycle*: vehicle batteries • *Reuse*: tires • *Hazardous waste facility*: fuels, oils, paint, spent oil/chemical/ pesticide containers, contaminated soil, mud, and water, ACM and PCBs

Domestic	Batteries, printer ink and toner, cleaning products, paints, and fluorescent lights	• *Recycled*: batteries, toner cartridges • *Landfill*: fluorescent lights • *Hazardous waste facility*: paints and cleaning products
Medical and Laboratory	Bandages, materials and supplies for first aid, spent chemicals, and non-combustible waste like sharps (for example - needles and syringes)	• *Medical waste facility*: bandages, materials and supplies for first aid and sharps will be temporarily stored in proper medical containers until they are removed and transported to an approved landfill facilities • *Landfill*: spent chemicals such as iodine or hydrogen peroxide

Avoid and Minimize

- Avoid the use of materials subject to international bans or phase-outs due to high toxicity to living organisms, environmental persistence, potential for bioaccumulation, or potential for ozone layer depletion.
- Substitute hazardous material for nonhazardous materials, where possible.

Mitigate

- Where hazardous waste generation cannot be avoided but has been minimized, reuse waste (e.g. with waste oils).
- If waste cannot be reused, recycle it by an approved contractor where possible (e.g. batteries).
- Train workers on the correct transfer and handling of hazardous materials and measures for dealing with spills, including the use of personal protective equipment (PPE).
- Label and store according to chemical compatibility of contents.
- Store volatile waste in open, ventilated areas.
- Restrict access to waste storage areas to only qualified and authorized personnel.
- Establish dedicated storage areas for hazardous wastes with international convention signage and include, as appropriate, secondary containment, roofing and lock.
- Mark storage areas on facility maps/plans. Establish emergency plans for hazardous waste storage areas.
- Provide spill cleanup and fire extinguishing equipment and train personnel on use.
- Segregate medical wastes into sharp and non-sharp wastes.
- Place biohazard waste in containers that are closable, constructed to contain all contents and prevent leakage of fluids, labeled or color-coded, and closed prior to removal to prevent spillage or protrusion of contents during handling, storage, transport, or shipping.
- Do not dispose of liquid wastes from laboratories down sinks, to the ground or storm water drainage system. Train personnel in proper liquid waste disposal, directed to utilize the location of temporary storage.
- Separate oil and grease generated at camps and kitchens and dispose of as hazardous waste.

Monitor

Refer to general measures discussed in Section 4.1.5.1.

4.1.6 Contaminated Land and Groundwater

Key Risks and Impacts

Contamination of land and groundwater due to releases of hazardous materials, wastes or oils can impact human health and ecosystems. Land is considered contaminated when it contains hazardous materials or oil concentrations above background or naturally occurring levels. Table 4-10 presents a summary of project actions and their resulting risk and impact.

Table 4-10 Key Risks and Impacts Associated with Contaminated Land and Groundwater

Project Action	Potential Risk or Impact
• Handling of hazardous materials • Refueling and transportation of fuels • Storage of hazardous materials, fuels or waste • Excess application of pesticides • Accidental spills or releases • Typically, these situations result from human error, technical failures, worn equipment, defective maintenance, improper construction or failing infrastructure.	• Worker exposure to hazardous materials or vapor causing health problems and death • Community exposure to hazardous materials or vapor causing health problems and death • Contamination of soils/water resources altering quality of soil / water and altering biodiversity • Liability for remediation • Reduced soil productivity
• Interactions with and management of contaminated land and groundwater could be required for: • Excavations and civil works • Dredging • Tunneling • Drilling	• Worker exposure to hazardous materials or vapor • Mobilization of contaminated soil and groundwater

There are three scenarios that need to be considered in relation to contaminated land and groundwater: avoid releases that could cause contamination; control and remediate any release and spills; and manage existing contamination and the associated liability at a brownfield site.

The contractual relationship between the contractor and the developer should address liability for environmental damage and cleanup of contaminated land.

Good Practice to Avoid and Minimize, Mitigate, and Monitor Contaminated Land and Groundwater

Avoid and Minimize

- Use appropriate storage tanks for fuel storage. Follow recommended American Petroleum Institute (API) standard 650 for the preparation and installation of the tanks.
- Carry out preventative maintenance of storage equipment and facilities, such as hydrostatic testing of tanks and pipes.
- Implement secondary containment in storage and fuel transfer area, with a capacity of at least 110% of the tank with the largest volume and slopes leading spills to areas where the substance can be contained and then pumped. All equipment must have an emergency shutdown. Restrict access to storage areas.
- Locate hazardous materials and fuel storage away from operation areas, populated areas (to the extent possible), bodies of water, areas prone to flooding, and vehicle access routes.
- Choose routes and vehicles transporting large quantities of fuel and hazardous materials carefully. The routes should have checkpoints and emergency action points. Vehicles should be no more than 2 years old, be maintained in accordance with manufacturer recommendations, and have appropriate signage.
- Characterize areas of existing contamination to understand the contaminants, receptors and exposure pathways. Any activities which might impact these should be carefully planned in correspondence with government regulations and in accordance with contractual obligations.
- Select pesticides and other chemical products that are biodegradable and avoid the use of banned or listed substances.

Mitigate

- Develop and implement specific Emergency Plans or Contingency Plans for sites where hydrocarbons and/or petroleum products are stored.
- Train all employees on the handling of spills and fires and create adequately trained and supplied first aid and fire safety brigades. Storage areas, and areas with activity of vehicles containing or transporting fuel and/or hazardous materials, should have spill kits containing oleophilic (e.g., attracts oils rather than water) cloths and blankets, retardant foams, sand, and any other item that prevents a spill from spreading. There should also be fire extinguishers and a communication plan.
- Use signage at each of the facilities involved in storage of any type of hydrocarbon or petroleum product following National Fire Protection Association (NFPA) 30 and 30A.
- Clearly identify with signage areas for storage of spill kits and related Personal Protective Equipment (PPE) for clean-up events. Post evacuation route maps at several locations within the various facilities of the Project.
- Organize mixed emergency response groups, i.e., including participation of non-government organizations (NGOs), community organizations, and government institutions as appropriate.
- Develop a pesticide management plan for the storage, management and disposal of pesticides following international standards.

Monitor

- Inventory fuels and hazardous material quantity purchased/acquired, delivered, stored, and used.
- Investigate root causes of incidents relating to hydrocarbon spills.
- Periodic inspections and maintenance of equipment and machinery, as well as of the facilities themselves, such as surfaces and walls of secondary containment structures.
- Monitor the use and storage of pesticides and control its application in soils as per recommended dosage.

4.2 OCCUPATIONAL HEALTH AND SAFETY

OHS risks are inherent to the construction phase of large development projects, given the dynamics of various work fronts, evolution of potential hazards and quantity of workers on site at any one time. According to the International Labour Organization (ILO), there are more than 2.3 million deaths per year globally as a result of accidents at work or work-related diseases. As compared to annual workplace fatal accident rates of 0.5 and 3.5 per 100,000 workers across developed countries, the ILO estimates an annual global average rate of around 13 fatalities per 100,000. Fatality rates in Latin America, however, are estimated between 17 and 19 per 100,000. The ILO also estimates that work-related illness and accidents cost up to 10% of Gross Domestic Product (GDP) in Latin America.

Management of OHS hazards is critical to the successful construction of a project in any sector. Unintentional injuries contribute to lost time injuries in a construction setting. Significant or reoccurring incidents can escalate to delays in the construction schedule, reputational risks to the project or company, regulatory citations and/or increased insurance costs.

4.2.1 Over-exertion

Key Risks and Impacts

The potential for overexertion injuries are present within any construction effort where workers are conducting both excessive and non-excessive physical labor. Occupational groups at highest risk are those involved in transportation and material handling; installation, maintenance and repair; construction and extraction, and demolition. Actions which present the greatest risk for over-exertion include lifting, pushing, pulling, holding, carrying, lowering, throwing, bending, crawling, reaching, twisting, and climbing, amongst others. The most common types of injuries resulting from over-exertion are strains, sprains and tears which are followed by soreness and pain. In some situations these injuries can lead to disability. The back is the body part most prone to injuries from over-exertion, followed by the shoulder, arm, wrist and knee.

Table 4-11 Key Risks and Impacts Associated with Over-exertion

Project Action	Potential Risk or Impact
• Working in an awkward posture, which places excessive stress or pressures on body parts • Lifting, lowering, carrying or moving heavy items, including sudden, forceful jerk lifting • Repeating certain movements for long periods of time without adequate breaks	• Strained, sprained or torn muscles or ligaments primarily in the lower back, shoulders, arms, wrists or knees; • Increased risk for compressional nerve damage and disability. • Increased risk for vertebral disc compression or rupture and nerve damage; • Increased heartrate higher than recommended level for size and physical condition; • Fatigued condition leading to dropped items and injury to other body parts or other people. • Generating prolonged stress on a body part, ultimately leading to chronic pain and injury.

Good Practice to Avoid and Minimize, Mitigate, and Monitor Over-exertion

Avoid and Minimize

- Plan work site layout and activities to avoid activities, which require individuals to perform a task in an awkward posture, carry or move heavy items, or require repetitive motion over long periods of time.
- Where avoidance is not possible, select tools and design work stations to reduce exertion requirements and holding times, and which promote improved posture.
- Where possible, use lifting and carrying equipment that provides a mechanical advantage over the capabilities of a person.
- Ensure that the demands of a task do not exceed the capabilities of the worker.
- Enforce weight and height limits above which mechanical lifts or two-person lifts are required.
- Train workers on safe movement techniques and ergonomics to prevent over-exertion (e.g., routine stretching and warm-up, keep back straight, bend at knees, never lift with arms extended, maintain solid footing with feet shoulder-width apart, keep load as close to body as possible, get help to carry heavy, bulky or large loads, etc.).

Mitigate

- Ensure tools and machinery utilized to replace excessive physical labor are properly designed, well maintained, and available.
- Address and treat sore or fatigued muscles/ligaments as soon as pain is felt to prevent strains, sprains or tears.
- Implement administrative controls into work processes to ensure the necessary job rotation and rest of stretch breaks depending on the activity.

Monitor

- Continuously assess adequacy of worker's physical condition and capabilities for each task performed.

- Continuously monitor positioning of workers while performing tasks with the potential for over-exertion.
- Track the health of workers with prior reports of over-exertion injuries or who perform activities with high potential for over-exertion.
- Track and analyze incident reports and worker grievances involving over-exertion to determine common root causes that can be systematically addressed.
- Inspect tools, equipment, and work procedures used by workers to minimize activities that may cause over-exertion.

4.2.2 Slips, Trips and Falls

Key Risks and Impacts

In general, slips, trips and falls occur due to a loss of traction between the shoe and walking surface or an inadvertent contact with a fixed or moveable object. Slips, trips and falls on the same elevation are among the most frequent cause of lost-time accidents at construction sites. These incidents are often associated with poor housekeeping, such as excessive waste debris, loose construction materials, liquid spills, and uncontrolled use of electrical cords, ropes and chains on the ground.

Table 4-12 Key Risks and Impacts Associated with Slips, Trips and Falls

Project Action	Potential Risk or Impact
• Industrial and domestic activities which require discharge of water or other liquids to a surface • Generation of permanent or temporary material or waste piles in work areas • Blocking aisles, corridors, entrances or stairways with clutter, materials or equipment • Creation of uneven walking surfaces or terrain during land movement or other construction activities • Activities which require extension of cords, ropes, cables, air hoses, or chains across an area of worker movement • Working in inclement weather where surfaces may be impacted by rain, sleet, ice, snow, hail or frost • Conducting an activity without paying full attention to task and signage or getting distracted.	• Injury on a body part including fractured bones, open cuts, sprains, tendinitis or other temporary or permanent injury involving internal or external bleeding or trauma that requires first aid or medical attention. • Open or closed head injury including concussions, scalp wounds, skull fracture. • Workers' lost time

Good Practice to Avoid and Minimize, Mitigate, and Monitor Slips, Trips and Falls

Avoid and Minimize

- Implement good house-keeping practices, such as sorting and placing loose construction materials or demolition debris in

established areas away from foot paths; assign responsibilities for housekeeping activities to be implemented on a regular basis.
- Locate electrical cords, cables, air hoses, ropes and chains in designated areas and marked corridors; secure and cover where possible.
- Issue slip retardant footwear to all workers.
- Avoid creating obstacles in aisles, corridors, entrances or stairways with clutter, materials or equipment.
- Create and maintain proper lighting.
- Train workers on the importance of working carefully and attentively, stay within designated working/walking areas, and to be aware of slips, trips and falls hazards. The workers should be instructed to bring to the attention of their supervisor when unsafe conditions are observed.
- Include slip, trip and fall discussions periodically in the daily tool box talks and inform workers where unique hazards may exist.
- Install signaling that indicates any slip hazards in work areas.

Mitigate
- Reduce contact with wet or slippery surfaces by cleaning-up liquid spills immediately, treat icy outdoor areas with anti-slip material (or suspend activities in the affected area), display signage as needed, install moisture absorbent mats in entrance areas, use anti-skid tape as needed.
- Correct poor housekeeping and hazardous conditions as soon as identified.

Monitor
- Include inspections for slip, trip, and fall hazards during the daily walk-through safety inspections.
- Monitor overall housekeeping practices and completion of activities assigned to responsible parties.
- Track and analyze incident reports and worker grievances involving slips, trips and falls to determine common root causes that can be systematically addressed.

4.2.3 Working at Heights

Key Risks and Impacts

Most construction sites require select workers to perform activities at an elevation, which creates the hazard of falling from heights (equal to or greater than 2 meters on construction sites). Falls from elevation associated with working with scaffolding, ladders and partially-built structures are among the most common cause of permanent disabling or fatal injury (around 30%). Injuries can be sustained either from the fall itself or from collision with other hazards (e.g., water, hazardous substances, electrical equipment, machinery, etc.). While fall protection equipment is extremely effective to prevent serious injury, it is often used inadequately or inconsistently. Also, the lack of prompt recovery of workers who fall and are caught in fall restraint harnesses can present a

very serious and prompt hazard of orthostatic hypotension, which can result in death in less than 20 minutes.

Table 4-13 Key Risks and Impacts Associated with Working at Heights

Project Action	Potential Risk or Impact
• Working at heights greater than two meters	• Without adequate fall protection, a fall from heights greater than two meters can lead to serious injury or death. Injury types include but are not limited to broken bones and/or internal organ damage, depending on the nature of the fall.
• Working at any height above a surface that could cause injury to a worker, such as operating machinery	• Without adequate fall protection, a fall from any height above a hazardous surface can lead to serious injury or death. Injury types include but are not limited to broken bones, electrocution, dismemberment, impalement, and/or internal organ damage, depending on the underlying hazard.
• Working at any height above an open tank, pit or vat containing hazardous materials, and near any open water sources, such as when working on bridges, breakwaters, wharves, or boats	• Without adequate fall protection, a fall from any height above an open tank, pit or vat containing hazardous materials can lead to serious injury or death. Injury types include but are not limited to chemical burns, drowning or chemical asphyxiation, depending on the contents of the open tank, pit or vat.

Good Practice to Avoid and Minimize, Mitigate, and Monitor Working at Heights

Avoid and Minimize

- Where fall hazards exist, establish and implement a fall protection plan which includes at a minimum:
  - Use of fall prevention devices, such as rail or barriers able to support a weight of at least 200 pounds (90 kilograms), when working at heights of about or greater than two meters on construction sites, or at any height where the risk includes falling into operating machinery, water or liquid, hazardous substances, or through an opening.
  - Permanently mark or paint lines on elevated work areas, such as roofs, within two meters of the perimeter. Require a Permit to Work at Heights for any work between the roof edge and that two-meter line.
  - Use control zones and safety monitoring systems (e.g., warning tape and signs) to warn workers of their proximity to fall hazard zones, including openings in floors, roofs or walking surfaces.
  - As back-up to fall prevention or where prevention configurations are not practicable, use personal fall arrest systems (e.g., full body harnesses and energy absorbing lanyards) able to support 5,000 pounds (2,270 kilograms) (including the tie-in point).

    - Engineer and test all anchor points prior to use.
    - Require training certification program for workers to understand the hazards associated with working at heights and the fall prevention/arrest equipment requirements.
    - Establish fall rescue procedures to respond to workers whose fall have been successfully arrested, and ensure that the recovery equipment is readily available and in place before a person works at heights (rescue must be completed within 15 minutes to avoid death by orthostatic hypotension).
    - Cover openings in floors or other elevated penetrations with a secured (nailed or screwed) and labeled cover. The cover should indicate in bold paint that it is covering a hole.
- Use fall protection equipment that complies with standards of the United States Occupational Safety and Health Administration (US OSHA) and/or the American National Standards Institute (ANSI) or other internationally recognized standard.
- Other best practices for injury prevention related to fall hazards include:
    - Never should a worker be lifted in the bucket of a front-end loader or other earth moving equipment or on the front of a forklift unless they are in a lifting cage that is designed for that purpose.
    - When working on scaffolds, the worker should also be using fall restraint harnesses that are attached to the scaffold.
    - Use two-step relief straps on all fall prevention harnesses to reduce the potential for orthostatic intolerance. Do not permit waste straps only, but require full body harnesses.
    - Use safety nets along perimeters of elevated areas.
    - Consider man-lifts versus ladders where possible; workers should still use fall restraint devices and harnesses attached to the man-lift equipment, even those with enclosed rails.
    - Ensure by conducting drills that a person can be recovered in less than 15 minutes after a fall, since after about 15 minutes a person can die if left hanging in fall restraint harnesses.

Mitigate

- Ensure fall protection configurations and equipment are maintained and inspected according to the US OSHA and/or ANSI standard or other internationally recognized standard.
- Closely manage training programs and records to ensure only trained personnel are working at heights.
- Working at heights should be a permit-required activity. The permit shall require that the hazards and controls are addressed in the work permit and the permit is signed off by the worker and a working-at-heights competent person.

Monitor

- Continuously monitor adequacy and integrity of configurations installed at site and equipment for working at heights.
- Track and analyze incident reports and worker grievances involving working at heights to determine common root causes that can be systematically addressed.
- Include in the Permit to Work at Heights the requirement for an inspection of all engineered and PPE prior to use, and ensure that the recovery equipment is in place.

4.2.4 Struck by Objects

Key Risks and Impacts

Struck-by hazards exist on any construction site where a worker could be struck or hit by an object. These hazards include being struck-by falling objects, flying objects, swinging/slipping objects, and objects on ground level. This may include, for example, the potential fall of material or tools as well as ejection of objects from power tools or machinery. All high pressure line or vessel work and overhead mechanical material handling work are considered high risk of struck-by-object work. Workers struck by objects are likely to experience injury to the head, eyes, and extremities.

Table 4-14 Key Risks and Impacts Associated with Being Struck by Objects

Project Action	Potential Risk or Impact
• Working or walking below elevated work surfaces where materials are stored or being handled	• Objects may fall from elevated surfaces and strike workers underneath, causing serious injury to head, eyes or extremities.
• Using power tools to grind or strike materials or conducting activities which require pushing, pulling or prying	• Flying objects from the use of power tools or other activities present the risk of striking and injuring the worker conducting the activity or others nearby.
• Suspension of loads	• Workers underneath suspended loads are at great risk for serious injury and likely death if the load slips or is dropped.
• Movement of heavy equipment and trucks on site	• Movement of heavy equipment and transport vehicles present continuous risks to inattentive workers in the vicinity to be struck by the equipment. Injuries will likely be serious in nature.
• Using pressurized air above 30 pounds per square inch (psi)	• Air pressurized above 30 psi can drive oils and other particles through skin openings, such as cuts. Generally for intact skin, injection through the skin can occur at less than 100 psi, and higher pressures can cause lacerations and amputations.

Good Practice to Avoid and Minimize, Mitigate, and Monitor Accidents Struck by Objects

Avoid and Minimize

- Avoid working or standing under loads that are being lifted and suspended.
- Use a designated and restricted waste drop or discharge area for safe movement of wastes from different elevations.
- Conduct activities such as sawing, cutting, grinding, sanding, chipping or chiseling with proper machine guards, PPE, and anchoring and where possible away from by-stander workers.
- Avoid driving heavy equipment over loose scrap by keeping movement areas clear.
- Install fall protection measures for materials stored at heights (e.g., toe-rail boards on scaffolding, and dropped object capture netting) to prevent objects from falling onto workers.
- Follow local standards for safe practices during blasting operations to evacuate workers from rock fly zones; use blast mats or other means of deflection to minimize fly rock.
- Do not allow workers to carry tools or equipment in their pockets or hands when working at heights. Tools should be lifted after the worker has secured his position when working at heights. Upon completion of work at heights, an inspection should be conducted for any loose parts, equipment, or tools.
- Require the use of high visibility vests when working around moving vehicles.

Mitigate

- Ensure all workers have access to and are trained in the use of PPE to reduce injury from being struck by objects, such as safety glasses with side shields, face shields, hard hats and safety shoes.
- Ensure that all grinding, drilling, and cutting equipment is properly guarded and periodically inspected to ensure the guards remain in place. Any equipment that is missing guards should not be permitted on site and/or taken out of operation.

Monitor

- Continuously monitor risks associated with falling, flying or dislodged objects during daily inspections.
- Track and analyze incident reports and worker grievances associated with being struck by an object to determine common root causes that can be systematically addressed.
- Inspect tools, equipment, and work procedures used by workers to minimize activities that may lead to getting struck by an object.

4.2.5 Moving Machinery

Key Risks and Impacts

Vehicle traffic, earthmoving equipment, motorized man lifts, mobile cranes and the use of lifting equipment in the movement of machinery and materials on a construction site may pose temporary hazards, such as physical contact, spills, dusts (both silica and nuisance), emissions, and noise. Heavy equipment operators have limited fields of view close to their equipment and may not see pedestrians close to the vehicle. The problem is further complicated on construction sites in that set

segregated pathways for people and moving equipment frequently change between days. Center-articulated vehicles create a significant impact or crush hazard zone on the outboard side of a turn while moving.

Table 4-15 Key Risks and Impacts Associated with Moving Machinery

Project Action	Potential Risk or Impact
• Vehicle traffic within work zones where workers are present	• Vehicle traffic through non-designated areas or where workers are within the vicinity increases the chance for impact with a worker and potentially serious injury or fatality associated with such impact.
• Movement of heavy equipment within work zones where workers are present	• Inadequate operation of heavy equipment and/or unsafe activities by workers may lead to impact of moving machinery with a worker, causing a potentially seriously injury or fatality.

Good Practice to Avoid and Minimize, Mitigate, and Monitor Accidents with Moving Machinery

Avoid and Minimize

- Ensure all vehicles have a service brake system, emergency brake system and a parking brake system; working lights; an audible warning device and back-up alarms; and an intact windshield with working wipers.
- Plan and segregate the location of vehicle traffic, machine operation, and walking areas.
- Control vehicle traffic through the use of one-way traffic routes, establishment of speed limits, and on-site trained flag-people wearing high-visibility vests or outer clothing covering to direct traffic.
- Ensure the visibility of personnel through their use of high visibility vests when working in or walking through heavy equipment operating areas.

Mitigate

- Use inspected and well-maintained lifting devices that are appropriate for the load, such as cranes, and securing loads when lifting them to higher job-site elevations.
- Establish a ground spotter during all load lifting operations to direct people away from the areas under the lifting and swing paths of the lifted loads.
- Train workers to verify eye contact with equipment operators before approaching the operating vehicle.
- Ensure that all heavy equipment operators and drivers have the proper training and/or licenses to perform the associated tasks and are aware of the hazards associated with moving machinery and its safe operations.

- Check vehicles at the beginning of each shift to ensure that the parts, equipment, and accessories are in safe operating condition. Repair or replace any defective parts or equipment prior to use.

Monitor

- Continuously monitor risks associated with moving machinery during daily inspections.
- Track and analyze incident reports and worker grievances associated with moving machinery to determine common root causes that can be systematically addressed.
- Inspect vehicles, lifting equipment and work procedures used by workers to minimize activities that may lead to injuries from moving machinery.
- Develop a heavy equipment operator's detailed weekly safety inspection check list and a method to red-tag any defective equipment until damaged equipment can be repaired and restored to safe operation.

4.2.6 Confined Spaces and Excavations

Key Risks and Impacts

Construction sites associated with infrastructure development (e.g., oil and gas, mining, etc.) often require work within confined spaces or excavations, such as vats, hoppers, tanks, sewers and pipes. Ditches and trenches may also be considered a confined space when access or egress is limited. Unlike general industry worksites, construction sites continually evolve with the number and characteristics of confined spaces changing as work progresses. According to US OSHA, a confined space is defined as a wholly or partially enclosed space not designated or intended for human occupancy and in which a hazardous atmosphere could develop. A confined space requiring a permit is one that contains physical or atmospheric hazards that could trap or engulf the person. Inadequate preparation of access or egress into a confined space or a rescue attempt could lead to serious injury or multiple fatalities. It is not uncommon to have multiple fatalities in confined spaces that involve not only the entrant but also recovery personnel. Safety and health hazards associated with confined spaces include ignition of flammable vapors or gases, asphyxiation and exposure to hazardous chemicals, or entrapment/drowning. All Latin American countries require some form of regulatory compliance with confined space programs; where there are confined spaces, it is always an area of focus for internal and external safety audits, given the level of risk.

Table 4-16 Key Risks and Impacts Associated with Confined Spaces and Excavations

Project Action	Potential Risk or Impact
• Entering a confined space such as a tank or pipe	• Inadequate preparation for entry greatly increases the risks of asphyxiation or exposure to hazardous chemicals, leading to neurological damage or fatality without immediate rescue.
• Working within	• Excavations without proper stabilization could

trenches, ditches, tunnels or other confined excavations	collapse and entrap a worker, leading to injury or death by crushing or asphyxiation.

Good Practice to Avoid and Minimize, Mitigate, and Monitor Accidents in Confined Spaces and Excavations

Avoid and Minimize

- Engineer sites as to eliminate the presence of confined spaces or reduce their risk profile.
- Where confined spaces cannot be eliminated, control site-specific factors to reduce the risks associated with confined spaces. These include: stabilizing excavation slope, use of excavation dewatering, side-walls support, separation barriers for heavy equipment or vibrating equipment from getting to close to the side walls of the excavations and slope gradient adjustments that eliminate or minimize the risk of collapse, entrapment, or drowning.
- Install adequate signage for use of PPE as well as other safety and emergency response instructions (e.g., fire-fighting equipment, exit, etc.).
- "Permit-required" confined spaces (PRCS) must follow standards established by US OSHA 29 CFR 1926.1200 (effective August 3, 2015) for training, entry, venting, monitoring, PPE and rescue operations (also summarized further in WB EHS Guidelines) or other internationally recognized standard.
- Provide safe means of multiple access and egress from excavations, such as graded slopes, graded access route, or stairs and ladders.
- Avoid the operation of combustion equipment for prolonged periods inside excavations areas where other workers are required to enter unless the area is actively ventilated.
- Ensure adequate engineering of ventilation system considering volume or air injected and number or workers.
- Design emergency rescue cabins for use in the event of an entrapment. The cabins should provide oxygen, water, food, first aids and sufficient space for the average number or workers during one shift.
- Access hatches, where present, should follow International Organization for Standardization (ISO) standards.

Mitigate

- Closely manage training programs and records to ensure only trained personnel are working in confined spaces.
- For confined spaces that have the potential for liquid, gas, or solid releases into the confined space, vessel, or tank, the supply lines shall be either blanked off or valves shut and then locked out and tagged. Pressurized lines or piping and energized circuits within the confined space shall be de-energized of hazardous energy levels and then locked out and tagged.
- Provide workers with monitoring devices that can indicate the level of oxygen and presence of harmful gases.

- For confined spaces that will require respiratory protection, properly equipped rescue personnel shall be readily available at the confined space entrance to execute prompt rescue.
- For confined spaces with vertical entry, appropriate lifting rescue equipment shall be installed and attached to the entrance, such that non-entry rescue can be executed. The rescue equipment shall be equipped with a mechanical advantage winch system and shall have automatic locks from free spinning and dropping the rescued person back into the vessel or confined space.

Monitor

- Atmospheric conditions within permit-required confined spaces must be monitored on an on-going basis to assure oxygen content is between 19.5 and 23%, and that the presence of flammable gas or vapor does not exceed 25% of its respective Lower Explosive Limit (LEL). In some situations, monitoring of additional hazardous gases or vapors may need to also be required. When conditions do not comply with target levels, the area must be ventilated until safe or additional PPE is required to enter.
- Continuously monitor adequacy of confined space programs (both permitted and non-permitted).
- Track and analyze incident reports involving confined spaces to immediately address common root causes.

4.2.7 Other Hazards to Workers

Key Risks and Impacts

Construction sites pose a multitude of risks not easily classified, which may result in short- or long-term injuries depending on the nature and duration of exposure. These include risks associated with exposure to dust, chemicals, noise, hazardous or flammable materials, electrocution, handling wastes, and moving parts on machinery, amongst others. While "other hazards" may often be overlooked given the perceived low severity of potential risk, injuries sustained from these hazards may in fact comprise a majority of reported incidents. Inadequate management of the above greatly increases risk factors which are normally easily preventable with training, PPE, programs and procedures.

Table 4-17 Key Risks and Impacts Associated with Other Hazards

Project Action	Potential Risk or Impact
• Breaking or puncturing underground utilities	• Risk of electrocution and or flooding of the confined space which can increase the risk of drowning and/or side wall collapse for excavations
• Side wall collapse of excavations by heavy equipment with the heavy equipment and operator falling into the excavation	• Injury or death of the equipment operator and possible crushing of workers in the excavation

Good Practice to Avoid and Minimize, Mitigate, and Monitor Accidents by Other Hazards

Avoid and Minimize

- Conduct an occupational health and safety assessment to determine all sources for hazards and identify measures for prevention, and where not possible, mitigation to safe conditions with engineering and administrative controls.
- Establish a robust health and safety program including programs and procedures to train workers and implement best practice.
- Use specially trained personnel/contractors as appropriate to identify and remove waste or hazardous materials (e.g., polychlorinated biphenyls) from tanks, vessels, processing equipment or contaminated land prior to and during the construction phase (which may involve some form of demolition).
- Use specially trained personnel/contractors for all electrical work and implement a robust lock-out, tag-out program in accordance with US OSHA Control of Hazardous Energy standards and Construction Electrical Safety (OSHA 29 CFR 1910.147 and CFR1926, Subpart K) or other internationally recognized standard.

Mitigate

- Assignment and use of risk- specific PPE based on results of the occupational health and safety assessment. PPE may include gloves, eye protection, respirators, clothing/protective suits, and hearing protection.
- Closely manage training programs and records to ensure that all employees are trained to identify and minimize their risks associated with all hazards.

Monitor

- Establish a health and safety inspection program to continuously oversee activities to identify potential risks associated with all hazards and confirms implementation of the site's health and safety programs.
- Track and analyze incident reports and worker grievances involving all hazards to determine common root causes that can be systematically addressed.

4.3 COMMUNITY HEALTH AND SAFETY

Construction site hazards and their associated health risks to community members vary greatly from project to project and largely depend on the relative location of communities to project infrastructure and/or the likelihood that community members come in close proximity or enter construction sites. Preventing injury to communities from site hazards including traffic is largely within the control of the construction contractor assuming strong safety measures and awareness rising is conducted. Preventing injury to community members can protect the health of local communities and protect a project against subsequent reputation damage. Disease transmission is an issue that affects both

workers and community members alike. The transmission of diseases can present serious risks to project continuity and can be devastating for communities with a limited capacity to respond to an outbreak.

See *Appendix A* – Case Studies on Community Health & Safety:
Community Health Audit in a Road Expansion Project in the North Amazon

4.3.1 General Site Hazards

Key Risks and Impacts

Construction sites present many hazards related to the use of equipment and heavy machinery; clearing, building and excavating activities; the presence of hazardous chemicals; and the overall risk of falling objects and other hazards. While workers are typically provided the equipment and training to work safely in these environments (see Section 4.2), community members do not have these safety measures in place and those that live, spend time near, or enter into construction sites can be at a high risk of injury or death. Those most at risk may be children or youth who may be more attracted to playing near or in construction sites; and/or community members whose livelihoods, traditional activities, or cultural practices depend on accessing resources in or near the project site (grazing areas, water, schools, health centers, or burial sites).

Table 4-18 Key Risks and Impacts Associated with General Site Hazards

Project Action	Potential Risk or Impact
• Presence of equipment and heavy machinery • Site clearing activities and excavations • Detonations/ blasting • Construction activities • Presence of chemicals and hazardous materials Factors that can increase the injury risk to communities include: • Lack of, or poor, boundary/fence around the construction area/site • Lack of signage indicating areas that are off-limits to the public • Poor surveillance measures to ensure non authorized personnel do not enter construction areas	• Accidents, injuries and death linked to construction site hazards. This may also include risk of drowning often linked to linear projects where excavation activities leave open channels that can fill with water and pose drowning risk if barriers are not used. Because local communities, especially in rural areas, often have limited access to comprehensive health care, even minor accidents may have irreversible, long-term health consequences. Community members may be more inclined to enter a project area if: • It is located on land they used previously (for grazing, hunting, fishing, water access) • If there is no project boundary or if it can be broken into easily • If there are items at the project site of

• Lack of communication with local communities regarding risks posed by construction sites	resale value (particularly important in areas with high unemployment and poverty)

Good Practice to Avoid and Minimize, Mitigate, and Monitor General Site Hazards

Avoid and Minimize

- Identify project activities and infrastructure that may overlap with areas of community importance or value (grazing or fishing areas, travel routes, areas to access to drinking water for communities or their animals) and, to the extent possible, use alternative routes, design, or technologies to prevent their impact.
- When planning mobilization and construction activities, as part of site-safety risk identification process, identify specific hazards to community members and develop list of appropriate mitigation measures, as described under the Mitigate section below.
- Use good international industry practice such as IFC Performance Standard (PS) 4 in the design, construction, operation, and decommissioning of the structural elements or components of the project.
- Provide adequate signage, lighting, barriers/fencing and surveillance to avoid improper and unsafe use of, or access to the site, facilities, or equipment.
- Engage with Affected Communities to raise awareness regarding project activities and potential risks and deter community members from entering the project site.
- Work with local schools, health providers and other community figures to transmit safety information to have a greater reach to a larger portion of potentially affected persons.

Mitigate

- When structural elements or components such as dams, tailing dams, or ash ponds are situated in high-risk locations, and their failure or malfunction may threaten the safety of communities, qualified experts with relevant and recognized experience in similar projects should be engaged to conduct risk analysis exercises to identify potential risks of failure and to develop specific measures based on the risks.
- Significant downstream risks could be created due to dams and in particular tailings dams. Application of appropriate measures to avoid/reduce the risk of exposure as well as contingency planning, in coordination with downstream users, is critical to reducing and managing this risk.
- Grievance mechanism: monitor and address community grievances related to site safety risks, and use this information as an early warning system to identify risks not already considered or to assign a different severity rating to risks.
- If accidents occur, log accident details, develop a corrective action and report the accident to local communities and reinforce prevention measures.

Monitor

- Monitor and inspect construction areas that may pose hazards to communities and ensure that all appropriate safety measures are in place.
- Track and report training and awareness raising activities, especially those to households in close proximity to the project's construction sites and to schools.
- Track accidents and near misses involving community members and site safety hazards and develop corrective actions. Establish specific goals and targets to reduce/eliminate site safety hazards for communities and collect, track and review performance on a regular basis (monthly or quarterly) with senior management.
- Track community site safety complaints or concerns using a grievance mechanism and develop corrective actions.

4.3.2 Disease Prevention

Key Risks and Impacts

Large and typically all-male workforces with disposable income moving into impoverished areas can have an influence on the presence and transmission of diseases either directly - by bringing in workers with diseases and/or that can contribute to spreading diseases; or indirectly – by influencing factors that contributes to the spread of disease such as population influx or increase in population density. In addition, land clearing, excavation activities, and changes to land-use can impact the spread of vector-borne diseases (e.g., through insects), as well as the creation of still waterbodies that can serve as breeding areas for mosquito-borne diseases (e.g., dengue). Those most at risk for contracting and spreading diseases can include single, male workers; sex workers; those living in extreme poverty; and isolated indigenous people whose limited contact with the outside world puts them at greater risk of contracting and recovering from diseases.

Table 4-19 Key Risks and Impacts Related to the Spread of Diseases

Project Action	Potential Risk or Impact
• Land clearing, excavation activities and changes in land-use • Creation of stored or stagnant waterbodies • Presence of large, predominantly male workforces who are single or have limited access to spouse/ family. Workforce management can influence external	Introduction and/or spread of vector-related diseases (such as malaria, dengue and chikungunya); and infectious diseases (such as the human immunodeficiency virus (HIV)/acquired immunodeficiency syndrome (AIDS), syphilis, tuberculosis (TB), H1N1). If projects put pressure on local waste, water and sanitation systems, water-borne illnesses may increase due to the potential increase in contamination and/or the collapse of existing systems. Conditions that increase the risk of introducing diseases / disease transmission include: • Widespread poverty and limited economic opportunities • Influx of people in search for economic opportunities • Prostitution

factors affecting disease transmission: • Population influx • Prostitution • Pressure on local waste and sanitation services.	• Presence of endemic diseases • Presence of "isolated indigenous people" who due to their limited contact with other communities may have less immunity to diseases brought-in by foreigners (e.g., common cold), which can be fatal. • Limited access to vaccines, screening and preventative health services • Cultural norms around the use of contraception

Good Practice to Avoid and Minimize, Mitigate, and Monitor Disease Transmission

Avoid and Minimize

- Ensure that as part of impact assessment studies, the potential risk of introducing and/or transmitting disease, taking into consideration local vulnerabilities and the planned workforce, is assessed. Assessment should consider the size and relative location of communities to project and worker camps, local socioeconomic conditions, existing availability of employment opportunities locally and regionally (in particular for women), the local health and disease profile, cultural norms around the use of contraception, capacity of the local health care system and sanitation services, and, if social problems exist, around alcoholism, drug use, or prostitution.
- Minimize land clearing and other changes in land use that can spur vector-related diseases. Avoid or control the creation of still waterbodies or large water storage that may act as breeding areas for mosquitoes or other disease vectors.
- Consider how different type of worker housing alternatives (workers housing integrated within community, open camps, closed camps) may impact disease transmission.
- Consider alternative design and/or siting options to reduce risk of population influx, prostitution and other project safety risks.
- Reduce the project's contribution to influx by measures such as:
  - Disseminate clear employment and contracting requirements to manage expectations.
  - Adopt clear policies on hiring away from the project site.
  - Increase local sourcing (for employment, goods, and services), reducing influx into the project area.
  - Establish exclusion zones around the project site and worker camps to limit illicit activity and prevent establishment of follower camps.
- Institute policies restricting worker contact with the community and restricting workers loitering in nearby communities. Prevent the spread of disease (such as Sexually Transmitted Infections - STIs, malaria, dengue) among workforce by:
  - Conduct regular health screenings as part of hiring procedures and on an ongoing basis. Provide adequate treatment and monitoring of worker health.
  - Provide disease prevention health education training focusing on disease of local relevance (for example STIs, malaria, and

dengue) in worker induction programs and as a regular part of continuous trainings for workers.
    - Put in place and enforce a code of conduct that outlines appropriate worker behavior and any restrictions between workers and community members.
    - Consider providing contraception to workers, if relevant, based on STI risk.
    - Consider STI/HIV/AIDS voluntary counseling.
    - Provide testing and referral services.

Mitigate

- Coordinate with local or regional public health officials on:
    - Identification, reporting and surveillance, and management of new cases (particularly if there is an outbreak of a communicable disease in worker camps or at work sites).
    - Improving local/regional health care screening and response capacity for infectious diseases (STIs, malaria, dengue fever, as relevant) diagnosis education, prevention and treatment programs.
- In areas with a high risk of disease transmitted by mosquitoes (e.g., malaria, dengue, yellow fever, chikungunya, West Nile Virus):
    - As part of a site-safety program, continuously monitor open ditches, receptacles and other areas that can collect rain and create still-water environment where mosquitoes con proliferate.
    - Consider mosquito control programs.
    - Use site-wide grievance mechanism to identify any complaints or potential impacts and risks related to the transmission of disease (e.g., complaints around prostitution).

Monitor

- Work in collaboration with local health authorities on disease surveillance and outbreak monitoring.
- Track worker health statistics and use in real-time to identify risks and additional measures that may be necessary. To the extent possible, share relevant worker health statistics with regional health authorities.
- Monitor and inspect worker compliance with disease prevention training and compliance with the code of conduct.
- Monitor related complaints via grievance mechanism and develop any corrective actions that may be necessary. Allow for a anonymous grievance mechanism.

4.3.3 Traffic Safety

Key Risks and Impacts

Infrastructure projects normally have large transportation requirements for carrying materials, personnel, and goods to and from a project site during the construction phase. A project's transportation needs (whether trucks, other road vehicles, vessels, or aircraft) and the construction and use of roads can generate both positive and negative effects on community health. Infrastructure projects are often located in

rural and peri-urban areas with limited public transportation and high pedestrian and bicycle traffic. Those most at risk are often local citizens whose daily activities occur at the same time or in the same vicinity as the project's activities. Community H&S risks from traffic accidents can often be one of the most significant impacts of projects. Although traffic accidents may not occur frequently, the consequences for individuals, families and communities can be significant and the damage can be permanent. These incidents can also lead to reputational damage and reduce overall project support.

See *Appendix A* – Case Studies on Community Health & Safety: *Alto Maipo Hydropower Project, Chile*

Table 4-20 Key Risks and Impacts Associated with Traffic Safety

Project Action	Potential Risk or Impact
• Project transportation and traffic, including traffic from contractors. Project factors that increase traffic safety risks: • Large and sudden increases in traffic • Presence of heavy machinery and oversize loads • Limited safety training of drivers	• Increase in the risk of accidents and associated injury among local community members. Conditions, that if present in the project area, can increase the risk of accidents: • Mixed-use traffic (pedestrian, motorcycle, animals) shared on the road • Poor road conditions and poor signage (pot-holes, lack of signs, narrow roads, single lane roads) • Safety culture of local communities and level of adherence to speed limits and traffic laws • Local culture's familiarity with sharing the road with heavy motorized vehicles • Presence of community gathering areas near project activity or alongside access roads used for project activities
• Construction and/or improvement of roads	• Road upgrades and/or construction can present risks of falls, injury from falling objectives and injury from the presence of construction machinery to nearby communities if construction areas are not properly blocked off, allowing community members to enter into construction areas. • On the other hand, road improvements can provide benefits to local communities by: • Reducing accident risk due to better road conditions • Reducing travel times • Increasing access to important social infrastructure and services (e.g., such as schools, health centers, markets to sell goods or services)

Project traffic and use of heavy machinery and materials can also lead to other impacts on local communities such as noise and vibration (see Section 4.1.3), dust and air quality (see Section 4.1.4), and potential

transmission or introduction of vector-related diseases (see Section 4.3.2).

Good Practice to Avoid and Minimize, Mitigate, and Monitor Traffic Accidents

Entities specialized and/or frequently engaged in road transportation activities should seek the development of a Road Traffic Safety Management System in line with ISO 39001 and obtain corresponding certification. Additional details on this measure are further explained below.

Avoid and Minimize

- Ensure that as part of traffic impact studies any high risk accident areas are identified. Common high-risk areas may include: where roads are located close to schools, markets and other community gathering places; intersections of roads with railroads; crossing points for animals; and other areas with high pedestrian, bicycle, and vehicle traffic.
- Consider alternative designs, routes or technologies that may be used to reduce the risk to communities (e.g., alternative routes, use of bypass roads).
- Consider developing safety-linked incentive schemes and avoid time/volume-linked incentives for all transportation activities.
- Enforcement of a zero drug and alcohol tolerance policy while on the job, monitoring and enforcement.

Mitigate

- On the basis of social baseline studies, community consultation, engagement with authorities and traffic count, develop and implement a traffic management plan, which considers:
  - Limited hours of project traffic to avoid hours of peak local use, especially around schools and markets;
  - Regular vehicle maintenance;
  - Speed control measures;
  - Traffic signage where the local authority allows;
  - Mandatory driver safety training; and
  - Enforcement to comply with traffic safety measures.
- Carry out community education and public awareness about project traffic, routes used, road signage, and safety measures, especially if project traffic may impact high-risk areas.
- Grievance mechanism: monitor and address grievances regularly to identify complaints related to traffic safety risks.
- Include specific clauses regarding driver safety training, vehicles maintenance, speed limits, loading capacity limits, and other safety requirements in subcontractor contracts, management system procedures and other relevant documentation.
- In areas where risk of accidents remain high even after mitigation, consider working in coordination with local traffic authority to put in place pedestrian pathways, overpasses, additional signage or traffic lights to reduce accident risk.

- Develop and implement an emergency preparedness and response plan (EPRP) that considers the response to relevant emergency situations, including traffic accidents involving the project and communities. Consider the following:
  - Develop with input of local emergency responders (i.e., fire, police, hospitals). This will allow local responders to understand the potential risks of the project and to better prepare themselves for any risks around the project.
  - If local emergency response capacity is weak, consider making investments (training for example) to build up local capacity for emergency response.
  - Conduct emergency preparedness scenarios with local responders to practice the appropriate response, communication and coordination.
  - Communicate emergency risks to the broader local community (not just first responders) so that community members know what the potential risks may be and can prepare accordingly.

Monitor

- Track near misses and develop corrective actions.
- Track traffic safety complaints in grievance mechanism from communities and develop corrective actions. If there is large concern among communities over traffic risks and/or there are particularly sensitive traffic risk areas, develop and implement a traffic monitoring program to ensure worker compliance with the traffic management plan.
- Consider the use of participatory monitoring of traffic safety risks and near misses, as well as to monitor community adherence of local traffic safety laws.
- Track traffic accidents and fatalities in coordination with local authorities to assess any long term changes over time.

4.3.4 Engagement

Key Risks and Impacts

Infrastructure projects can bring sudden changes to local communities within the project's area of influence. If local communities do not have information about the project, its activities, potential impacts, and benefits, they will be less able to adapt to the changes brought on by the project and will more likely reject the development of the project. This could lead to a greater level of impact to communities as well as a decrease in the likelihood that communities can take advantage of the benefits from infrastructure projects (such as opportunities for employment, procurement and the provision of goods and services). Lack of information between projects and local communities can also lead to mistrust, growing opposition from communities and conflict. Therefore engagement with a wide range of stakeholders is a necessary process for any development project that will have an influence on local communities and the region where the project is located. The degree of stakeholder engagement that is required will vary project to project but will depend on the level of risks that the project poses to communities;

the scale and size of project activities; the presence of vulnerable or protected groups (such as indigenous peoples); and the degree of local opposition and or national controversy surrounding a project. While local laws and regulations may vary with regards to specific requirements around engaging stakeholders, developers need to consider the appropriate level of engagement based not only on national laws but on the risk profile of the project and its social context.

Table 4-21 Key Risks and Impacts Associated with Engagement

Project Action	Potential Risk or Impact
• Presence or expansion of a Project. • Project factors that can increase impact to communities and require greater level of engagement: • Large scale projects that create medium-high impact on local communities, biodiversity and cultural heritage • Projects causing physical resettlement • Large scale controversial projects either due to being located in sensitive environments and/or due to the type of project.	• Limited or poor level of engagement can lead to an increase in the impact to communities by the project due to a lack of awareness and understanding around the nature and time scale of the project and what the project risks and impacts may be to local communities. • Lack of engagement can harbor mistrust and can contribute to conflict and lack of local, regional and national support for development projects. Local conditions, that if present, will require greater level of engagement: • Projects that may impact indigenous peoples livelihoods, traditional lands and resources • Local opposition to project, developer or history of opposition to similar projects • Level of local experience with large scale development projects (smaller, rural communities may be more at risk relative to more urban areas which may already be influence by other development projects). • Projects that may require physical or economic displacement of local community • A project of national interest that may attract media attention and opposition from outsiders that can influence the local community.

While projects should engage a wide array of stakeholders, at minimum the project should engage those stakeholders that are likely to be impacted by the project (also known as Affected Community), and those that may exert influence on the project. It is particularly important to engage with a broad range of local leadership as well as members of the community and to make sure that different sub groups of the population are being included in engagement activities (e.g., women, youth, elderly, ethnically marginalized groups). Greater level of engagement should take place with communities that will be most affected by the project. Engagement is a continuous process that starts as early as possible (prior to mobilization and construction) and that continues throughout the project lifecycle.

Good Practice to Avoid and Minimize, Mitigate, and Monitor Conflicts due to Engagement

Avoid and Minimize

- Identify and map out all stakeholders affected by the project and those that can exert influence over the project. Develop an engagement plan to start engaging with community stakeholders as early as possible prior to commencing any mobilization activities on the ground and far in advance of any construction related activities. Engagement activities prior to commencing mobilization and construction should include:
  - Providing Affected Communities with information about the project activities and timeline;
  - Providing detailed information to communities regarding the specific risks and impacts to communities from the project;
  - Discussion of mitigation measures that have been developed to prevent risks and impacts;
  - Collection of feedback from a wide range of stakeholders regarding their concerns and recommendations on how mitigation measures may be more effective; and
  - For EPC contractors, include any additional engagement actions as specified by the ESIA and corresponding management plans that should be considered in the engagement plan.
- Specific engagement activities may be required in cases where the project may affect indigenous or vulnerable communities or communities that will be physically or economically displaced.
- Improve mitigation measures and strategies using the feedback obtained by community stakeholders.
- Plan and allocate dedicated resources (i.e., community relations team) to maintain a continuous communication channel between stakeholders and the project sponsor and EPC contractor.
- Establish specific contractual conditions with EPC contractors regarding stakeholder engagement activities.
- Stakeholder engagement activities should be free, timely, informed and designed to be culturally appropriate, including providing information in the local language of preference by local communities.

Mitigate

- Update engagement plan to reflect new issues that need to be discussed and addressed with local communities. Updated at least on an annual basis and/or when there are major changes in project design and or siting which lead to impacts not previously identified.
- Develop process and procedures that support engagement activities such as an engagement policy, documentation process, database to track engagement activities, feedback obtained and grievances.
- Undertake engagement activities on a continual basis to address community concerns and to gather information necessary for the project.
- Put in place a grievance mechanism and provide information to communities about how to use this process as a way to communicate with the project.

- Team leading engagement activities will need to work collaboratively with all departments to support engagement around different topic areas (biodiversity monitoring, traffic safety, construction schedule) as identified in management plans developed for the project.
- Provide trainings and clear expectations to workers and contractors on how interactions between the Project and the community should take place (i.e., ensure that only authorized personnel engage and make commitments to communities). Other project staff should report any interactions with communities, complaints received or incidents to the project person responsible for managing stakeholder engagement.

Monitor

- Track complaints and community concerns via grievance mechanism. Consider monitoring the following information:
  - Percent of grievances based on topic area;
  - Average number of days it takes to resolve grievances;
  - Number of grievances resolved out of total; and
  - Feedback from different stakeholder groups to track conversations and commitments made with different stakeholder groups.
- Track commitments made by the project and document those in a commitments register and make sure that actions are that developed are integrated into engagement plans.
- Use a simple engagement tracking log.
- On a monthly or quarterly basis, review engagement conducted, grievances received and commitments made and determine if engagement activities need to be updated.
- Monitor and update any changes in the stakeholder map, such as changes to local authorities and other local leaders.
- Monitor local and national media regarding stakeholders associated to the project.

5.0 MANAGEMENT SYSTEM

The international good EHS management practices and standards are most effectively developed and implemented through a management system designed for a specific project. A management system is a set of processes and practices to implement a company's policies, guide behaviors and actions, maintain compliance, and drive improvement while meeting business objectives. The goal is to consistently use appropriate policies and procedures to assess and control risks. This can help manage costs and avoid, minimize or mitigate environmental impacts and labor and community risks while also protecting company reputation. Management systems are commonly required by regulatory authorities and clients of EPC firms (investors and their lenders). The most common framework underlying management systems is the Plan-Do-Check-Act (P-D-C-A) model. These iterative steps include:



- Plan: Establish the objectives and processes necessary to deliver expected results.
- Do: Implement the plan and execute the process (data collection for reporting should be included here).
- Check: Review performance and identify trends, gaps, and root causes.
- Act: Adjust the plan and incorporate learnings from implementation to close gaps and drive continued improvement (also can involve "corrective actions").

The P-D-C-A model can, and should be, interpreted and applied at both the practical level, such as implementing the good practice measures identified in Section 4, and at the strategic level with the management system itself. This model underlies the guidance from the IFC, the International Organization for Standardization (ISO) and other international standard organizations (see *Appendix C* for further references and resources). The ISO 14001 standard for environmental management systems was revised in 2015 and its new framework still follows the P-D-C-A approach (see **Error! Reference source not ound.**).

Figure 2 Revised ISO 14001:2015 Framework



Source: ISO14001:2015

Based on this revised approach, the context of the organization –or project- requires determining internal and external issues, understanding the needs and expectations of stakeholders and identifying intended outcomes, including enhancing the environmental performance. The core of the system is underpinned by the leadership structure, that is, the senior management commitment to integrate the environmental management into the business structure, communicate its importance, and promote continuous improvement throughout the project's life cycle.

In designing and developing a management system for the construction phase of a project, it is important to consider certain differences from a system that is designed for the operation and maintenance phase, in particular: (i) the expected short-term timeframe of the construction phase (e.g., 1-5 years); (ii) the changing nature of the construction phase and design changes and adjustment may be incorporated; (iii) the shared responsibilities between the project owner and the main EPC contractor and subcontractors and (iv) a group of stakeholders that will want to ensure that their expectations are met and that the project risks are managed. The management system should be designed in accordance with these aspects.

See *Appendix A* – Case Study on Environmental and Social Management System: *The Peru Liquefied Natural Gas (PLNG), Peru*

5.1 CORE: LEADERSHIP AND RESPONSIBILITIES

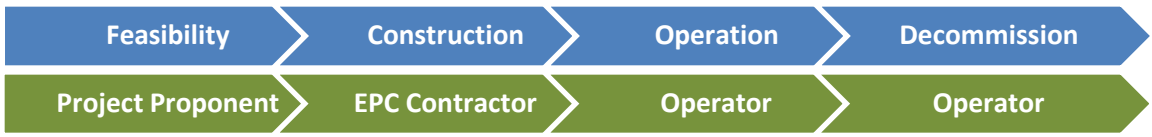
In most cases, for the construction phase, the project sponsor will be accountable for complying with the specific requirements stipulated in the environmental permit (i.e., EIA permit), but will pass on the execution responsibility to its EPC contractor and/or main contractor. It is thus important to ensure that the contractual clauses in the EPC contract account for adequate compliance with international standards, which are commonly required by the project investors or financers.

Moreover, the EPC contract should clearly state the responsibilities of the EPC contractor with regards to the EIA requirements and its implementation through a management system, as well as any other specific commitments, requirements, standards and restrictions, including passing on or ensuring that all subcontractors also abide by said standards and requirements. These requirements should be considered by the EPC Company in costing its bidding package, structuring of the execution teams, selecting the subcontractor companies and planning its resources and budget.

Likewise, the Project Sponsor should ensure that its role as project owner is fulfilled, most commonly by providing the EPC contractor with the minimum requirements for EHS management (i.e., Owner's Requirements) and through the development and implementation of the project sponsor's inspection, supervision and control of the EHS measures implemented by the EPC (i.e., Owner's Management Plan). It is also common in LAC that the project sponsor takes on specific responsibilities regarding the EIA commitments, most commonly, those involving community relations aspects or that fall outside of the contractual agreements with EPC's. In some cases, these include specific requirements of the lenders or investors.

The responsibility for EHS aspects shifts over the course of a project's lifecycle, as show in Figure 3. Through the feasibility stage, when the ESIA is developed and approved, the project proponent is responsible to identify risks and propose mitigation measures, including the standards and management considerations. During construction, the proponent passes on execution responsibilities to the EPC contractor, who is responsible for developing and implementing a management system to govern their actions based on the controls outlined in the management plans derived from the ESIA and applicable regulations. However, the legal liability usually remains with the project sponsor and is controlled through the contractual agreement with the EPC and subcontractors. As construction completion is reached and operations start, a management system for the operations phase should be developed and implemented by the operator; however, certain aspects of construction need to be smoothly transitioned for proper management. This may involve providing audit reports and minutes from management review meetings as well as having the incoming team shadow their EPC counterparts so as to facilitate knowledge transfer.

Figure 3 *EHS Responsibility throughout the Project's Life Cycle*



The management system should be developed before construction commences and be informed by the impact assessment process, local regulations, commitments, and corporate policies and standards. *Figure 4* presents the elements of a solid management system, which are interrelated. Each of these elements is important, because they help

assess, control and continually improve the environmental and social performance, as part of the Plan-Do-Check-Act cycle. The management system can also be integrated to include the health and safety aspects of management, using the OHSAS 18001:2007 as a reference.

Figure 4 Elements of an Environmental and Social Management System



Source: IFC, 2014. ESMS Implementation Handbook – Construction.

5.2 *PLAN: PLANNING*

The necessary steps to properly plan for EHS management throughout the construction phase of a project include:

- Policy: developing and rolling out policies that clearly outline what the objectives are and what restrictions apply. These provide guiding principles to shape behaviors and underpin the intent of the management system. This document is generally widely shared and may even be publicly available.
- Identification of Risks and Opportunities: key construction risks related to pollution prevention and resource efficiency, occupational health and safety, labor and community health and safety should be identified based on the impacts, applicable regulations and policies. Knowing the risks is critical to designing and implementing an appropriate system and corresponding EHS controls. Similarly, the opportunities arising from the project's development should also be considered and determined in the planning.
- Environmental aspects: the specific locations, environmental and social context, timing and other aspects of activities in relation to specific receptors should be studied with a life cycle perspective to ensure that all risks and opportunities are considered.
- Compliance obligations: ensure that the project has identified and manages the legal and other requirements; most commonly through the development and implementation of a permit and commitment registry.

- Action planning and evaluation: the system should include clear objectives that consider the risks and opportunities. The development of management plans and action plans are designed to meet said objectives and provide sufficient guidance and detail for their execution. The plans should also include key performance indicators to measure their effectiveness.

5.3 DO: IMPLEMENTATION, SUPPORT AND OPERATION

The actual implementation of the management system will need to meet the demand of the scale and complexity of the specific project, that is, it should be commensurate with the level of impacts and risks of the project. There are two key pieces to ensure the implementation is adequate: organizational capacity and management program.

- Organizational capacity and competency (Support): roles and responsibilities should be clearly identified and described. Individuals should have appropriate and sufficient experience and training for their role. They should also have the resources and controls necessary to deliver on their obligations. Clear lines of management within the organization and with the project developer or EPC (as applicable), should also be included. Competence and awareness should be enhanced with training as a means of achieving competence. Documented information on roles, responsibilities, training and capacity building should be available through procedures and records.
- Management programs (Operation): Individual programs and plans should cover the project's relevant issues and risks, as recommended in Section 4. An effective program or plan identifies what, who, why, when, and how. These can be developed as procedures and standard operating procedures (SOP). Progress in each plan should be measured against objectives and targets, established as measurable key performance indicators (KPI) and recorded. The management program should control planned changes and review the consequences of unintended changes through adaptive management. This should be done through a life cycle perspective, including the review of outsourced processes and supply chain, as well as the product design and development, transportation, use, end-life treatment and final disposal.

5.4 CHECK: PERFORMANCE EVALUATION

Management programs and plans should be developed and implemented with a clear monitoring component to monitor, measure, analyze and evaluate EHS performance, including those recommended in Section 4 as appropriate. The key overarching feature is the monitoring and audit programs that assess implementation and performance against obligations and expectations, which should have appropriate indicators (KPIs) and evaluation criteria. Monitoring data needs to be timely to assist in decision-making, properly documented

and auditable. It should be compared against established standards or limits that are regulated and/or internationally accepted.

In addition to these tactical checks, the management system should incorporate a grievance mechanism to address external feedback regarding performance or issues surfacing. Furthermore, reporting to senior management and external stakeholders (regulators, project proponent, and investors) requires robust reporting processes to assure the integrity of the data and provide an accurate and measurable representation of EHS performance. The management review is a crucial step to include changes in risks and opportunities based on the EHS performance trends. The output of this review is used in the strategic direction of the system.

5.5 ACT: IMPROVEMENTS

The checking and reporting described above is necessary to inform senior management on the effectiveness of the system. So adjustments and refinements can be made to achieve intended outcomes and drive continuous improvement. Periodic reporting should be provided to senior management for review and senior management, including those outside EHS, should meet at least annually to consider changes and improvements to the management system. On a more tactical level, when nonconformity occurs and is identified, action must be taken to remediate impacts and then to address the underlying root cause. A common approach for identifying the root cause is the "5 whys". For example:

1. **Why** did the leak occur? Oil leaked out of a tank.
2. **Why** did it leak out? Inadequate maintenance.
3. **Why** was the maintenance inadequate? The individual responsible did not know what to look for.
4. **Why** was their knowledge low? Inadequate training.
5. **Why** was training lacking? New employee who had not been adequately on-boarded.

6.0 *WHY ENVIRONMENT, HEALTH AND SAFETY MEASURES MATTER AND HOW THEY CAN HELP YOUR COMPANY'S BOTTOM LINE*

Actively managing financial and reputational risks has become a key task for modern internationally oriented companies. Companies, especially in the mining sector in LAC, have learned the hard way that neglecting to address EHS and social issues can pose serious threats to their business model and investments through creating delays, cost overrun, project failure and loss of further opportunities. Latin America and the Caribbean offer a lot of opportunities for investment and are in many ways a perfect partner for Chinese companies as there are many converging interests. At the same time the region and its countries require close attention and diligent preparation in order to have the social and environmental license to invest, build, operate and grow further.

This Note introduced some principles on managing environmental, health and safety projects in LAC. Of course every project is different and individual circumstances and challenges require different responses. But the general principle is to be well prepared, listen carefully, to take complaints seriously and to involve the stakeholders as early as possible. An engagement in foreign countries in overseas region nearly always poses some considerable risks and challenges, but our experience in advising different companies from different regions shows that these risks can be mitigated and the challenges addressed. Actually the companies which have a solid risk management system, a broad base of in-house knowhow to deal with these issues and the capacity to implement measures such as those presented herein are those which have the best chances to expand and globalize their business successfully.

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Appendix A

Case Studies

Red Vial 4 Toll Road Project, Peru

The Red Vial 4 Toll Road Project consists on the upgrading, expansion, and operation of an existing 283 kilometer (km) two-lane toll road to a four-lane toll road, along the Pan-American Highway in the northern Coast of Peru. The Project is executed under a twenty-five (25) year concession issued to Autopista del Norte (AUNOR) by the Republic of Peru's responsible agency, the Ministry of Transportation and Communication (MTC). Construction is conducted by an Engineering, Procurement and Construction (EPC) contractor, OHL Concesiones (OHL). Operation activities (i.e., maintenance, toll collection, customer service) are conducted by Operadora de Carreteras (OPECAR). AUNOR, OHL and OPECAR are owned by OHL Group.

One important aspect of the Project is that construction is scheduled to advance by sections, and as construction is completed in a section, the toll road enters into operation, having construction and operation activities happening in parallel. In addition, as the construction sections advance, ancillary facilities such as the camps, quarries, warehouses and waste storage areas also move, requiring the continuous installation and dismantling of these facilities.

Environmental Management System

In order to adequately manage the environmental performance of the project and comply with the requirements of the environmental permit, AUNOR, which is ultimately responsible for the environmental permit and lender requirements, passed on environmental management responsibilities to its EPC contractor (OHL) and the toll road operator (OPECAR), and retained a supervision role. OHL is responsible for implementing the Environmental Management Plan (EMP) for construction activities, as stated in the construction contract. OHL developed an Integrated Management System (IMS) based on ISO 14001:2004, OHSAS 18001: 2007 and ISO 9001:2008, which was certified by an accredited firm. OHL's IMS is also compliant with the requirements in the EIA's EMP, OHL corporate standards and lender's requirements. OPECAR also maintains a tri-norm IMS (i.e., ISO 9001:2008, ISO 14001:2004 and OHSAS 18001:2007) that, as OHL's, meets all applicable requirements. OPECAR and OHL have a coordinated approach through their IMS's given that construction and operation activities occur simultaneously. Some of these activities include weekly coordination, joint emergency response plans, joint community relations activities, efficiencies in waste management.

Solid Waste and Hazardous Materials Management

Solid waste and hazardous materials are generated at construction fronts and at the Camp and include industrial waste (e.g., metal scrap, cardboard, etc.) as well as hazardous waste (e.g., pads with hydrocarbons, waste oil, etc.) primarily from equipment maintenance. Accidental fuel/oil spills also can occur when vehicles are fueled. The project made significant improvements by ensuring that adequate procedures were in place for waste and hazardous materials management during construction and operation. Implementation of these measures was aligned with good international industry practice through OHL's waste management system, including: waste segregation in colored cylinders at Camp and work fronts with adequate signage; waste management training and awareness to all workers; monthly monitoring and record-keeping of hazardous and non-hazardous waste; hazardous wastes stored in enclosed areas with roofing, signage and containment areas; trained personnel authorized to enter the hazardous waste storage areas; hazardous and non-hazardous wastes removed by a certified third party disposal company (EPS-RS) and disposed of in certified landfills with proper chain of custody and regular inspection and auditing of the areas.



Jaguar Energy, Guatemala

A 300-MW coal-fired power plant owned by Jaguar Energy Guatemala (JEG) contracted China Machine New Energy Corporation (CMNC) for the construction of the power generation facility in Escuintla, Guatemala. The project's total investment was initially US$700 million, with commercial operation scheduled in 2013. The project's construction underwent several delays and in December 2013, JEG cancelled CMNC's contract (Central American Data, 2013). The project was halted for over a year, with significant losses in legal costs, new bids, delay in commercial operation start date and reportedly an additional US$400 million in restarting and finishing construction (E&N, 2014). The delays put the project at risk of losing its contract with Energuate, the offtaker (Central American Data, 2015). In June 2015 news broke of a major corruption scandal, involving bribes to Guatemalan officials for US$120 million in exchange for removing legal and environmental obstacles to the plant's construction (Deutsche Welle, 2015). That same month, Guatemala's Ministerio Publico raided the Jaguar plant after resident of the neighboring town of San Miguel de las Flores complained of a large number of dead fish and severe pollution of the adjacent Rio La Mora, allegedly caused by illegal dumping of contaminated waste water from the plant, reportedly from draining the boilers (Prensa Libre, 2015). As of late 2015, the Jaguar plant's status remains in limbo.



Source: Prensa Libre, 2015.

Constancia Mining, Peru

The Constancia mining project located in Cusco, Peru is wholly owned by Hudbay Minerals, a Canadian mining company. It consists of an open pit copper-silver-molybdenum mine and a concentrator plant and tailings dam. Construction began in 2012 and successfully culminated on schedule late 2014, commercial operations began late 2015. Hudbay is highly dedicated to OHS, included as one of their commitments in their Corporate EHS Policy. During the mine construction phase, with more than 7,000 workers at peak and a total of 38.6 million work hours, only 14 accidents with lost time injuries (LTI) occurred with no fatalities. In 2014, Constancia (including the EPC contractor) registered a lost time accident (LTA) frequency of zero. Their OHS performance reflects the safety culture and commitment of the entire construction staff, especially their EPC contractor. In addition to applying GIIP OHS measure, Constancia implemented specific programs and measures that supported their OHS performance including:

- Positive Attitude Safety System, which focused OHS discussion at all organizational levels to increase staff participation in OHS risk identification and management.
- Integrated Information System to register, investigate and monitor all incidents and accidents.
- GPS in project vehicles to monitor their speed and route and obligatory defensive driving training for all drivers.
- OHS training tailored for local workforce, with little or no experience in construction activities.
- Information disclosure to staff including OHS talks during lunch time and informative bulletins.

To continue their successful OHS performance, Constancia is planning to obtain OHSAS 18001 certification within 2 years from start of their operations.





(All information and photos obtained from Hudbay's website and 2014 annual report)

Four worker fatalities at an open-pit copper mine in South America

During construction and operation-type activities at an expanding copper mine in South America, four fatalities were recorded in just over two years (2010-2012). These included a contract worker crushed by a train (moving machinery), a miner buried by a rock fall caused by the weight of a truck along the edge of an excavation (struck by an object, confined space, moving machinery, other hazards), company employee falling during construction of a road to the mine (working at heights), and company employee struck and pinned by a metal sheet (struck by an object). At the start of construction, the three mine trade unions suggested to the Company's CEO that union and management representatives meet to discuss safety issues once every three months. At the time of the fourth death, only one meeting had been held. As a result of the last incident, the union demanded that the safety meetings resume and the dismissal of the Company's safety managers. During the discussions around the last incident (falling sheet metal), the Safety Manager blamed the foreman for the accident. However as a result of the investigation, it was determined that the foreman was not employed in the area where the accident occurred and there were no foreman overseeing the work. Additionally, there were not enough mechanics for the task, so management brought in workers from other departments to work as "support staff"; these individuals were not trained in the tasks and risks associated with the activities they were asked to support. Moreover, root cause analysis of the rock fall death determined that the area had experienced repeated rock falls, yet no measures were taken to stabilize the walls or avoid heavy machinery from working on the edges. Overall, the Company's safety management team was negligent, not adequately managing risks, resulting in four preventable deaths within two years.



Alto Maipo Hydropower Project, Chile

The Alto Maipo Hydropower Project is a 531-MW run-of-river hydropower plant located 50 km east of Santiago, Chile, owned by Alto Maipo SpA, a wholly-owned subsidiary of AES Gener and is being built by two major contractors, Hotchief and Strabag. The Project will require the construction of 31 km of new access roads and will also utilize existing public roads. In addition, given that the Project is located in the Metropolitan Region and is subject to the Metropolitan Region Air Pollution Prevention Plan (PPDA), a compensation of 150 percent of emissions of particulate matter (PM10) is required.

In order to avoid community health and safety impacts (e.g., traffic related accidents, nuisance, interference with tourism activities and health impacts related to air quality), the project implemented a series of design controls, mitigation and management measures for implementation during the construction phase. A traffic simulation model was used to determine the impacts of construction activities in the area and in addition, the results of consultation with stakeholders were used as input to refine the measures. Construction of new roads was minimized by improving and using existing roads; project-related traffic was limited to a specific schedule avoiding weekend times when roads are most used by tourists and locals; the air quality compensation requirement was complied with the paving of 22 kilometers of roads in the project area and dust suppression was implemented throughout the project's roads with cistern trucks using treated wastewater. In addition, bi-monthly monitoring of traffic was implemented at select intersections and conducted by a specialized consultant.

Despite the measures initially implemented, once construction started, the project received several grievances from community members related to traffic safety. In addition, the project was subject to the requirements of international lenders, which reinforced the need for additional traffic safety measures. In response to these requests, the following additional measures were implemented: traffic safety awareness training for all workers and specific training for drivers; traffic safety campaigns for workers and community members; installation of Global Positioning Systems (GPS) on project vehicles, including contractors' vehicles, linked to a database that is tracked and monitored by the Health and Safety Teams; reporting of speed exceedances through an escalation system that starts with a reminder to the driver through the separation of the driver for repeat offender situations; improvement of traffic signs in coordination with the transportation authority; a specific grievance mechanism for traffic-related complaints and the creation of a Traffic Brigade as part of the Participatory Monitoring Program, which is conducted by women community members trained in the use of speed meters and in the identification of project vehicles. The implementation of these measures has led to a decrease in speeding and repeat offenders as well as a decrease in traffic-related grievances.

CASE STUDY ON ENVIRONMENTAL AND SOCIAL MANAGEMENT SYSTEM

The Peru Liquefied Natural Gas (PLNG), Peru

In recent years, the private sector has come to better understand the risks associated with poor stakeholder relations—and the opportunities provided by constructive ones. Across all sectors examples abound of companies that commit to systematic stakeholder engagement, and those that do not. Companies that understand the importance of engaging with affected communities and others throughout the life of the project are reaping the benefits of improved risk management.



The challenge: The Peru Liquefied Natural Gas (PLNG) the first liquefied natural gas plant in South America is an example of a high-profile project facing multiple environmental and social risks. Launched in 2007, the $3.8 billion project is one of the largest industrial projects in Peru. The project traversed 35 rural Andean communities, many in remote highland areas. Some of these communities had a negative perception of pipeline projects based on past experience. PLNG's challenge was to address community concerns

on an ongoing basis and involve communities in monitoring the environmental and social risks of the project.

The approach: During the construction phase of the pipeline project (2008–2010), PLNG introduced a unique participatory monitoring program—the first such program conducted during the construction stage of a gas pipeline in Peru. This Participatory Social and Environmental Monitoring Plan (known by its Spanish acronym, PMSAP), was implemented by ProNaturaleza, a well-respected local NGO with several years of experience conducting similar programs, and with technical assistance from IFC Advisory Services. ProNaturaleza hired 82 members of communities along the pipeline to monitor environmental and social aspects of the project. The monitors received extensive training on environmental issues such as erosion and soil quality, waste management, and pollution prevention. Through the monitoring program, PLNG built trust with communities and relied on community feedback to improve their environmental and social performance.

PMSAP's design and feedback mechanisms evolved over time. Continuous improvements were made to PLNG's environmental and social risk management system as a result of the participatory monitoring effort. Community feedback was taken seriously by PLNG in the monitoring plan, and influenced the design of the monitoring program. Additionally, the data and design of the participatory monitoring program were continuously tested and improved. For example, PLNG analyzed the data and found that some issues occurred repeatedly in the "other issues" category on questionnaires used by monitors; this justified creating new categories to properly document them. Monitors also regularly suggested additional data point ideas to ProNaturaleza's technical team. Information gathered by monitors led to changes in action plans or the development of new PLNG action plans. In addition to reviewing the project, monitors validated all changes or responses that PLNG made as a result of the monitors' findings.
Source: IFC, 2013.

Appendix B

References and Resources for EHS Regulations

*Table B-1 Key EHS Regulatory Authorities in Sample Countries**

Key EHS Authority	*Role*	*Contact Information*
Brazil		
Ministério de Meio Ambiente - MMA (Ministry of the Environment)	The ministry aims to promote the protection and restoration of the environment and the sustainable use of its resources.	Esplanada dos Ministérios - Bloco B CEP: 70068-900 - Brasília/DF +(61) 2028-1057 www.mma.gov.br
Conselho Nacional de Recursos Hídricos - CNRH (National Council of Water Resources)	Oversees legislation, permitting, and project analysis regarding water resources.	SEPN 505 – Lote 2 – Ed. Marie Prendi Cruz 1º andar – sala 108 CEP: 70730-542 +(61) 2028-2075/2076 www.cnrh.gov.br
Conselho Nacional de Meio Ambiente - CONAMA (National Council on the Environment)	The consultative and deliberative organ of the National Environmental-SISNAMA system that establishes standards and criteria for potentially polluting activities.	Edifício Sede do Ministério do Meio Ambiente, Esplanada dos Ministérios - Bloco B, 9º andar, sala 950 70068-901 - Brasília/DF +(61) 2028-2207 www.mma.gov.br/port/conama/
Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis - IBAMA (Brazilian Institute of the Environment and Renewable Natural Resources)	Aims to protect the environment and sustainable use of its resources while promoting the environmental quality of life.	Trecho 2 - Ed. Sede - Cx. Postal nº 09566 - CEP 70818-900 Brasília-DF +(61) 3316-1212 www.ibama.gov.br/
Ministério de Agricultura, Pecuária e Abastecimento-MAPA (Ministry of Agriculture, Livestock and Supply)	The ministry focuses on policies to stimulate agriculture and agribusiness and the regulation of services related to the sector.	Esplanada dos Ministérios - Bloco D - Brasília/DF - CEP: 70.043-900 +(61) 3218-2828 www.agricultura.gov.br
Minisetério de Minas e Energia - MME (Ministry of Mines and Energy)	The ministry focuses on policy and legislation surrounding the fields of geology, minerals, and energy resources.	Esplanada dos Ministérios Bloco "U" - Brasília - DF CEP:70.065-900 +(61) 2032-5555 www.mme.gov.br/en/web/guest
Departamento Nacional de Produção Mineral - DNPM	Promotes the planning and development of mineral exploration and exploitation of mineral resources while	S.A.N. Quadra 01 Bloco B CEP: 70041-903 - Brasília – DF +(61) 3312-6666

Key EHS Authority	*Role*	*Contact Information*
(National Department of Mining Production)	ensuring that mining activities adhere to applicable regulations.	www.dnpm.gov.br
Agência Nacional do Petróleo, Gás Natural e Biocombustíveis - ANP (National Agency of Petroleum, Natural Gas and Biofuels)	Regulating body for the petroleum, natural gas, and biofuels industry that also grants permits and runs inspections.	Rio Branco, 65 / 22º andar - 20090-004 - Rio de Janeiro – RJ 0800-970-0267 www.anp.gov.br/
Ministério de Trabalho e Emprego - MTE (Ministry of Labor and Employment)	The ministry aims to promote policy and guidelines surrounding employment, training, worker safety, and the modernization of labor relations.	Esplanada dos Ministérios Bloco F CEP: 70056-900 Brasília – DF +(61) 2031-6000 www.mte.gov.br
Departamento de Segurança e Saúde no Trabalho - DSST (Department of Safety and Health at Work)	Plans and coordinates environmental monitoring and working conditions while protecting the life and health of workers.	Esplanada dos Ministérios Bloco F - CEP: 70056-900 Brasília – DF +(61) 3317-6672 (no website)
Secretaria de Inspeção do Trabalho - SIT (Department of Labor Inspection)	Oversees worker activity to ensure and promote worker safety, health and development while also proposing appropriate regulations	Esplanada dos Ministérios Bloco F - CEP: 70056-900 Brasília – DF +(61) 3226-9353 (no website)
Ministério dos Transportes (MT) (Ministry of Transportation)	The ministry formulates, coordinates and supervises national policies related to road, rail and water transport.	Esplanada dos Ministérios, Bloco "R" CEP: 70.044-902 - Brasília/DF +(61) 2029-7000 www.transportes.gov.br/
Ministério da Cultura - MinC (Ministry of Culture)	The ministry promotes various expressions of present-day national culture while also preserving its historical and archaeological artistic culture.	Sede Esplanada dos Ministérios, Bloco B, Térreo CEP: 70068-900 – Brasília/DF +(61) 2024-2022 www.cultura.gov.br
Fundação Nacional do Índio - FUNAI (National Indian Foundation)	Protects and promotes the rights of indigenous people in Brazil while promoting the sustainable development of indigenous peoples.	SBS Quadra 02 Lote 14 Ed. Cleto Meireles CEP: 70070-120 - Brasília/DF +(61) 3247-6000 www.funai.gov.br
Ministério de Saúde - MS (Ministry of Health)	Promotes and protects the health of the population to improve quality of life in Brazil.	Esplanada dos Ministérios Bloco G Brasília-DF / CEP: 70058-900 +(61) 3315-2425 http://portalsaude.saude.gov.br/
Mexico		
Secretaría de	The Secretariat is in charge	Blvd. Adolfo Ruiz Cortines

Key EHS Authority	*Role*	*Contact Information*
Medio Ambiente y Recursos Naturales – SEMARNAT (Federal Secretariat of the Environment and Natural Resources)	of developing the legal framework to protect the environment and biodiversity and to set the policies and guidelines related to every environmental aspect such as: environmental impact and risk assessment, waste, air emissions and biodiversity conservation.	# 4209 Col. Jardines en la Montaña, Deleg. Tlalpan Distrito Federal C.P. 14210 +(55) 5490-0900 www.semarnat.gob.mx/
Agencia de Seguridad, Energía y Ambiente - ASEA (Agency of Energy, Safety and the Environment)	Responsible for regulating and supervising all affairs related to industrial safety and environmental protection in the hydrocarbon sectors.	Melchor Ocampo 469, Col. Nueva Anzures, Delegación Miguel Hidalgo, Distrito Federal. C.P. 11590 +(55) 9126 0100 www.asea.gob.mx/
Comisión Nacional de Agua - CONAGUA (National Water Commission)	Decentralized entity from SEMARNAT, whose responsibility is to manage, regulate, control and protect national waters. Standards for the extraction and wastewater discharges and also parameters are set by CONAGUA.	Av. Insurgentes Sur # 2416, Col. Copilco el Bajo, Deleg. Coyoacán Distrito Federal C.P. 04340 +(55) 5174-4000 http://smn.cna.gob.mx/
Comisión Nacional de Hidrocarburos - CNH (National Hydrocarbons Commission)	In charge of regulating, monitoring and evaluating the activities of exploration and extraction of hydrocarbons in the country.	Vito Alessio Robles 174, Delegación Álvaro Obregón, Col. Florida, Distrito Federal. C.P. 01030 +(55) 1454 8500 www.cnh.gob.mx/
Procuraduría Federal de Protección al Medio Ambiente - PROFEPA (Federal Attorney for Environmental Protection)	Responsible for monitoring compliance of the legal provisions in environmental matters, establishes the legal consequences (i.e. fines, closures, civil arrest) for non-compliances caused by individuals and/or companies.	Carretera Picacho-Ajusco 200, Col. Jardines en la Montaña Del. Tlalpan. Distrito Federal. C.P. 14210 +(55) 5449-6300 www.profepa.gob.mx/
Secretaria de Marina – SEMAR (Navy Secretariat)	Responsible of organizing and monitoring Mexican Navy and protecting Mexican waters.	Heroica Escuela Naval Militar Núm. 861. Col. Los Cipreses, Del. Coyoacán. Distrito Federal C.P. 04830 +(55) 5624-6500 www.semar.gob.mx/
Dirección de Protección al Medio Ambiente Marino - PROMAM (Direction for Marine Environment Protection)	Part of the Secretary of Navy and is responsible for organizing and evaluating the development of programs to prevent and control pollution of the marine and coastal environments. Responsible for evaluating permits for the	Eje 2 Ote. Tramo Heroica Escuela Naval Militar Núm. 861. Col. Los Cipreses, Del. Coyoacán. Distrito Federal. CP. 04830 +(55) 5624-6500 http://digaohm.semar.gob.mx/promam.html

Key EHS Authority	*Role*	*Contact Information*
	dumping of wastes and other materials into the ocean.	
Secretaria de Comunicaciones y Transportes - SCT (Secretariat for Communication and Transportation)	Responsible to manage, control and regulation of the different known and unknown transportation methods; and their use (including transportation of hazardous materials and wastes). SCT controls the total use of radio frequencies and federal roads (including bridges and highways).	Avenida Xola, esquina con Eje Central, S/N, Col. Narvarte, Del. Benito Juárez. Distrito Federal C.P. 03020 +(55) 5723-9300 www.sct.gob.mx/
Secretaría de Desarrollo Agrario, Territorial y Urbano - SEDATU (Agricultural, Territorial and Urban Development Secretariat)	The Secretariat focuses on planning, coordinating, managing, generating and executing public land management policies, ensuring urban and rural development as well as providing legal certainty for agrarian settlements.	Av. H. Escuela Naval Militar #669, Col. Presidentes Ejidales, 2a Sección. Del. Coyoacán Distrito Federal. C.P. 04470 +(55) 5624-0000 www.sedatu.gob.mx/srawe b/
Secretaria de Energía – SENER (Energy Secretariat)	In charge of controlling, managing and regulating all energy sources (fuel, electricity, radioactive materials). It also regulates all the concessions that apply to the exploitation and use of energy sources.	Av. de los Insurgentes Sur 890, Col del Valle Centro, Benito Juárez. C.P. 03100 +(55) 5000-6000 www.energia.gob.mx/
Secretaría de la Defensa Nacional – SEDENA (National Defense Secretariat)	The Secretariat is responsible for Mexico's defense and military education. It organizes the Army and provides security to National territory and helps population in case of disaster. Also regulates the use and storage of explosive substances.	Blvd. Manuel Ávila Camacho S/N. Esq. Av. Ind. Mil., Col. Lomas de Sotelo; Deleg. Miguel Hidalgo. Distrito Federal C.P. 11200 +(55) 2122-8800 www.sedena.gob.mx/inicio
Secretaria de Salud – SSA (Federal Health Secretariat)	Controls, regulates and manages the country's health policies and legislation. Promotes the implementation of health services, campaigns and information. Develops sanitary guidelines for the general population and specific to workplaces and services such as food and health installations.	Calz. de Tlalpan 4492, 14050 Ciudad de México, D.F. +(55) 5655-1825 http://portal.salud.gob.mx/
Comisión Federal para la Protección contra Riesgos	A decentralized entity of the Federal Health Secretariat, in charge of controlling and	Oklahoma 14, Col. Nápoles, Delegación Benito Juárez, México, Distrito Federal.

Key EHS Authority	*Role*	*Contact Information*
Sanitarios - COFEPRIS (Federal Commission for the Protection against Sanitary Risk)	monitoring health facilities and installations. Also in charge of the prevention and control of harmful effects of environmental factors on human health. Regulates the control of products and services and the import and export processes of fertilizers, pesticides, hazardous substances and medicines.	C.P. 03810 +(55) 5080-5200 www.cofepris.gob.mx/Paginas/Inicio.aspx
Comisión Nacional de Seguridad Nuclear y Salvaguardias – CNSNS (National Commission of Nuclear Safety and Safeguards)	An entity part of SENER. Regulates the application of the legal requirements related to nuclear and radioactive installations and facilities ensuring that the import, export and use processes are conducted safely. Granting authorizations and approvals for projects which involve the use of nuclear energy sources.	Dr. José Ma. Barragán No. 779, Colonia Narvarte. Del. Benito Juárez. México, Distrito Federal. C. P. 03020 +(55) 5095-3200 www.cnsns.gob.mx/
Secretaría de Trabajo y Previsión Social - STPS (Federal Labor Secretariat)	Responsible for establishing the legal framework for the worker-employer relationships and contracts, conciliations and working methods also promotes job training and establishes the legal requirements and standards for health and safety.	Av. Anillo Periférico Sur 4271, Col. Fuentes del Pedregal, Tlalpan Distrito Federal C.P. 14140 +(55) 3000-2100 www.stps.gob.mx/bp/index.html
Dirección General de Inspección Federal de Trabajo (General Directorate for Federal Inspection of Labor)	Implements and monitors compliance with labor standards and law to improve compliance, safeguard worker health, and improve workplace conditions.	Anillo Periférico Sur 4271, Col. Fuentes del Pedregal, Tlalpan Distrito Federal C.P. 14140 + (55) 3000-2100
Peru		
Ministerio del Ambiente –MINAM (Ministry of the Environment)	The ministry aims for the conservation of the environment through sustainable, rational, and ethical use as it is integral to social, economic, and personal development. It is the governing body for national environmental policy	Av. Javier Prado Oeste 1440 San Isidro, Lima +(511) 611-6000 www.minam.gob.pe
Organismo de Evaluación y Fiscalización	Specialized technical agency that is charged with auditing, supervision, control, and	República de Panamá 3542 San Isidro, Lima +(511) 713-1553

Key EHS Authority	*Role*	*Contact Information*
Ambiental - OEFA (Agency for Environmental Evaluation and Audit)	sanctioning for environmental matters.	www.oefa.gob.pe
Servicio Nacional de Áreas Naturales Protegidas por el Estado - SERNANP (National Protected Areas Service of the State)	Governing body for the National System for Natural Protected Areas of the State. It decides the compatibility of activities with natural protected areas and provides binding technical opinions for the areas in its oversight.	Calle 17 355 San Isidro, Lima +(511) 717-7500 www.sernanp.gob.pe/sernanp
Ministerio de Energía y Minería - MINEM (Ministry of Energy and Mining)	The ministry that oversees all activities within the power, energy and mining subsectors.	Av. Las Artes Sur 260 San Borja. Lima +(511) 411-1100 www.minem.gob.pe/
Ministerio de Transportes y Comunicaciones - MTC (Ministry of Transportation and Communication)	The ministry that oversees all activities within the transportation and communication subsectors	Jr. Zorritos 1203 15082, Lima +(511) 615-7800 www.mtc.gob.pe
Dirección General de Asuntos Socio Ambientales - DGASA (General Directorate for Social and Environmental Affairs)	Oversees social and environmental impact studies within the Ministry of Transportation and Communication.	Jr. Zorritos 1203 15082, Lima +(511) 615-7800 anexo 3400 www.mtc.gob.pe/transportes/socioambientales/contactenos.html
Ministerio de Agricultura y Riego - MINAGRI (Ministry of Agriculture and Irrigation)	The ministry that manages issues of national scope within its subsector and realizes monitoring and evaluation of those issues with the aim to protect, conserve, utilize and manage renewable natural resources.	Jr. Yauyos 258 – Lima +(511) 209-8800 www.minagri.gob.pe
Dirección General Forestal y Fauna Silvestre - DGFFS (General Directorate of Forests and Wild Fauna)	In charge of putting forth policies, strategies, norms, plans, programs, and national projects related to the sustainable use of forest and faunal resources.	Calle Diecisiete 355- Urb. El Palomar - San Isidro, Lima +(511) 225-9000 (no website found)
Autoridad	Responsible for the norms	Calle Diecisiete 355- Urb. El

Key EHS Authority	*Role*	*Contact Information*
Nacional del Agua - ANA (National Water Authority)	and procedures regarding the integrated and sustainable management of water resources	Palomar - San Isidro, Lima +(511) 224-3298 www.ana.gob.pe
Ministerio de Salud - MINSA (Ministry of Health)	The ministry responsible for the health and safety of the individuals within the country.	Av. Salaverry 801 Jesús María, Lima +(511) 315-6600 www.minsa.gob.pe
Dirección General de Salud Ambiental - DIGESA (General Directorate of Environmental Health)	Manages the related elements of basic sanitation, occupational health, food hygiene, zoonotic disease, and environmental protection.	Las Amapolas 350 Urb. San Eugenio, Lince, Lima +(511) 631-4430 www.digesa.sld.pe
Ministerio de Trabajo y Promoción del Empleo - MTPE (Ministry of Labor and the Promotion of the Workforce)	The ministry that promotes general employability and maintains fundamental social rights for employees in the work environment.	Av. Salaverry 655 – Jesús María - Piso 7, Lima +(511) 332-4747 Anexo: 231 www.trabajo.gob.pe
Ministerio de Cultura - MINCU (Ministry of Culture)	The ministry in charge of Peru's cultural patrimony. This includes the authorization of archaeological work and oversight whenever earth must be disturbed and the rights of indigenous peoples.	Av. Javier Prado Este 2465 San Borja, Lima +(511) 618-9393 www.cultura.gob.pe
China		
Ministry of Environmental Protection	State level administration overseeing environmental protection.	115 Xizhimen Nanxiaojie St., Xicheng District, Beijing 100035 China +86 10 66556006
State Administration of Work Safety	State level administration overseeing work safety and occupational health.	21 Hepingli N St., Dongcheng District, Beijing 100713, China +86 10 64463104
Ministry of Land and Resources	State level administration overseeing land management and water and soil conservation.	64 Fuchengmennei St, Xicheng District, Beijing 100812, China +86 10 66558041
Ministry of Water Resources	State level administration overseeing water resources.	2 Baiguanglu Rd Ertiao, Xicheng District, Beijing, China +86 10 63202114
Ministry of Public Security	State level administration overseeing fire safety.	14 East Chang'an St., Dongcheng District, Beijing, China
Ministry of Commerce	State level administration issuing guidance on oversea project and investment.	2 East Chang'an St., Dongcheng District, Beijing China +86 10 65197703
China	CHINCA has been formed	2 Dongzhimen Nei St,

Key EHS Authority	*Role*	*Contact Information*
International Contractors Association (CHINCA)	voluntarily and legally by enterprises & related organizations engaging in international project contracting, manpower service and other international economic and technical cooperation.	Dongcheng District, Beijing, 100007, China +86 10 59765260 +86 10 59765255

** The information in the Table is designed to be a reference for inquiry. While the primary Ministries or Secretariats tend not to change often, changes to the sectorial and more focused agencies could occur.*

Table B-2 Summary of Key EHS Authorities, Legislation and Permitting Requirements in Focus Countries

*Key EHS Authority**	*Key EHS Legislation***	*General EHS Permitting*
Brazil		

• Environmental:
  ○ Ministry of the Environment (MMA)
  ○ Brazilian Institute of Environment and Natural Resources (IBAMA)
  ○ State Secretariat of Environmental (SEMA)
  ○ National Council on Water Resources (CNRH)
  ○ National Council on the Environment (CONAMA)
• Labor:
  ○ Ministry of Labor and Employment (MTE)
  ○ Department of Safety and Health at Work (DSST)
• Health:
  ○ Ministry of Health (MS)
• Mining and Energy:
  ○ Ministry of Mines and Energy (MME)
  ○ National Department of Mineral Production (DNPM)
  ○ National Agency of Petroleum, Natural Gas and Biofuels (ANP)
• Agriculture:
  ○ Ministry of Agriculture, Livestock and Supply
• Infrastructure:
  ○ Ministry of Transportation (MT)
	• National Environmental Policy
	• National System of Protected Natural Areas and other measures
	• National Water Resources Policy and Water Resources Management
	• Law providing for the Protection of Wildlife
	• Law providing for the Protection of Native Vegetation
	• National Policy on Solid Waste
	• Mining Code
	• National Agricultural Policy
		• EIA
		• Sector-specific permits
		• Preliminary license
		• Construction license
		• Public consulting
		• Central-, state- and municipal-level permits
		• Environmental permits for water use, waste discharge into water, emissions, waste generation, tree cutting.

Mexico		

• Environmental:
  ○ Federal Secretariat of the Environment and Natural Resources (SEMARNAT)
  ○ Navy Secretariat
  ○ Agency of Energy, Safety and the Environment
  ○ National Water Commission
  ○ National Hydrocarbons Commission
  ○ Federal Attorney for Environmental Protection
  ○ Direction for Marine Environment Protection
• Labor:
  ○ Federal Labor Secretariat
• Health:
  ○ Federal Health Secretariat
  ○ Federal Commission for the Protection against
	• General Law for Ecological Equilibrium and Environmental Protection
	• General Law for Climate Change
	• General Water Law
	• General Waste Law
	• Mining Law
	• Hydrocarbons Law
	• General Law for the Sustainable Development of Forestry
	• Federal Labor Law
		• ESIA
		• Public consultation when requested by affected community
		• Sector-specific permits
		• Central- and state-level permits
		• Environmental permits for water use, discharge into water, waste generation, emissions, hazardous waste transport.

*Key EHS Authority**	*Key EHS Legislation***	*General EHS Permitting*
Sanitary Risk ○ National Commission of Nuclear Safety and Safeguards • Energy: ○ Energy Secretariat		
Peru		
• Environment: ○ Ministry of the Environment (MINAM) ○ Agency for Environmental Evaluation and Audit (OEFA) ○ National Protected Areas (SERNANP) • Health: ○ Ministry of Health (MINSA) ○ General Directorate of Environmental Health (DIGESA) • Labor: ○ Ministry of Labor and the Promotion of the Workforce (MTPE) • Mining and Energy: ○ Ministry of Energy and Mines (MINEM) ○ General Directorate of Environmental Affairs – Energy (DGAAE) ○ General Directorate of Environmental Affairs – Mining (DGAAM) • Transportation: ○ Ministry of Transportation and Communication (MTC) ○ General Directorate for Social and Environmental Affairs (DGASA) • Agriculture: ○ Ministry of Agriculture and Irrigation (MINAGRI) ○ General Directorate of Forests and Wild Fauna (DGFFS) ○ National Water Authority (ANA)	• National System of Environmental Impact Assessment (ESIA) • General Environmental Law • General Law for Expropriations • Law for the Sustainable Utilization of Natural Resources • Law for the Sustainable Utilization for Biological Diversity • Forest and Wild Fauna Law • Law concerning Water Resources • Law for Natural Protected Areas • Law Regulating Environmental Liabilities (associated with mining) • General Hydrocarbons Law • Law Regulating Environmental Liabilities in the Hydrocarbon Subsector • Law for Safety and Health in the Workplace • General Law for Health • General Law for Solid Waste	• ESIA with public consultation • Environmental permits for water use, effluent discharge, emissions, waste treatment and disposal, tree cutting, acquisition and handling of hazardous material, . ○ Sector-specific permits ○ Central- and state-level permits
China		
• Environment ○ Ministry of Environmental Protection ○ Ministry of Land and Resources ○ Ministry of Water Resources ○ State Forestry Administration	• Environmental Protection Law • Environmental Impact Assessment Law • Work Safety Law • Occupational Disease	• Environmental Impact Assessment and subsequent Completion Acceptance Inspection (CAI) • Water and Soil Conservation

*Key EHS Authority**	*Key EHS Legislation***	*General EHS Permitting*

• Labor
  ○ State Work Safety Administration
• Outbound Investment
  ○ Ministry of Commerce
	Prevention and Control Law
	• Firefighting Law
	• Water Law
	• Water and Soil Conservation Law
	• Land Management Law
	• Guidance on Environmental Protection for Outbound
	• Investment and Cooperation
	• Guide on Social Responsibility for Chinese International Contractors
		Plan and subsequent CAI
		• Water Resources Assessment and subsequent Water Abstraction Permit
		• Occupational Disease Hazards Assessment and subsequent CAI
		• Safety Pre-Assessment and subsequent CAI

*Table B-3 Key EHS Regulation in Sample Countries***

Topic	*Key EHS Regulation*	*Brief Description*
	Brazil	
	Environment	
General	*Lei n. 6.938/1981, Política Nacional do Meio Ambiente* (Law n. 6.938/1981, National Environmental Policy) Associated regulation/law: *Lei 8.028/1991, Decreto n. 99.274/1990*	The National Environmental Policy aims to preserve, enhance and restore the environmental quality of life to ensure conditions for socio-economic development and to protect the interests of national security and the dignity of human life.
	Resolução CONAMA n. 03/1990, Dispõe sobre padrões de qualidade do ar, previstos no PRONAR. (CONAMA Resolution n. 03/1990, Air quality standards as stated in PRONAR) Associated regulation: *CONAMA n. 08/1990*	Establishes the national parameters for air quality. Associated regulation establishes maximum emissions to air from external combustion processes in new stationary sources with a potential of 70 MW or higher.
	Resolução CONAMA n. 08/1993 (CONAMA Resolution n. 08/1993) Associated regulation: *CONAMA 18/1986*	Establishes the maximum parameters of emissions to air from engines destined for new and heavy vehicles/
	Portaria IBAMA n. 85/1996, Dispõe sobre a criação e adoção de um Programa Interno de Auto Fiscalização da Correta Manutenção da Frota, quanto a Emissão da Fumaça Preta, por empresa que possuem frota própria de transporte de carga ou de passageiro, cujos veículos são movidos a óleo diesel. (IBAMA Decree n. 85/1996, Companies with their own auto fleets will adopt the Internal Auto-monitoring Program and Correct Fleet Maintenance)	Companies possessing their own diesel operating cargo transportation and/or passenger vehicles should adopt the Internal Self-Regulating and Fleet Maintenance Program.
	Resolução CONAMA n. 382/2006, Estabelece os limites máximos de emissão de poluentes atmosféricos para fontes fixas (CONAMA Resolution n. 382/2006, Maximum emissions limits for atmospheric pollutants from fixed sources) Associated regulation: *CONAMA n. 436/2011*	Establishes the limits of emissions to air from stationary sources.
	Resolução CONAMA n. 303/2002, Dispõe sobre parâmetros, defi nições e limites de Áreas de Preservação Permanente. (CONAMA Resolution n. 303/2002, Parameters, Definitions, and Limits for Permanent Preservation Areas) Associated Regulation: *Resolução CONAMA n. 302/2002*	Establishes that parameters, definitions and limits of Permanent Preservation Areas. Associated regulation outlines the parameters, definitions and limits of the Permanent Preservation Areas for artificial reservoirs, including the development of a mandatory environmental development plan.

Topic	Key EHS Regulation	Brief Description
	Brazil	
	Lei 9.985, Institui o Sistema Nacional de Unidades de Conservação da Natureza e dá outras providências. (Law 9.985, Instituting the National System of Protected Natural Areas and other measures) Associated regulation: *Decreto n. 4.340/2002*	Law and regulation surround the creating of the National System of Nature Conservation Unit (Sistema Nacional de Unidades de Conservação da Natureza – SNUC) and other measures.
	Resolução CONAMA n. 369/2006, Dispõe sobre os casos excepcionais, de utilidade pública, interesse social ou baixo impacto ambiental, que possibilitam a intervenção ou supressão de vegetação em Área de Preservação Permanente-APP. (CONAMA Resolution n. 369/2006, Provides for exceptional instances of public utilities, social interest, or low environmental impact, allowing for the removal of vegetation within Permanently Protected Areas)	Outlines those instances in which the removal of vegetation and/or the intervention in a Permanent Preservation Area is acceptable.
	Portaria MMA n. 09/2007, Reconhece como áreas prioritárias para a conservação, utilização sustentável e repartição de benefícios da biodiversidade brasileira as áreas que menciona (MMA Decree n. 09/2007, Recognizes priority areas for conservation, sustainable use, and sharing of the benefits of Brazilian biodiversity)	Update to the list of areas considered Priority Areas for Conservation, Sustainable Use and Benefit Sharing.
	Lei n. 5.197/1967, Dispõe sobre a proteção à fauna e dá outras providências (Law n. 5.197/1967, Providing for the protection of wildlife and other measures)	Law protecting wildlife (nesting, shelter, and natural breeding) and forbidding the use, destruction, hunting or harvesting of certain of wild fauna.
	Instrução Normativa MMA n. 03/2003 (MMA Normative Ruling n. 03/2003)	Updates to the National List of Brazilian Species of Endangered Fauna.
	Instrução normativa IBAMA n. 146/2007 (IBAMA Normative Ruling n. 146/2007)	Establishes the criteria for procedures regarding the management of wildlife (surveying, monitoring, rescue, recovery and disposal) in areas of influence for projects and/or activities considered to (or with the potential to) cause impacts to wildlife based on the Environmental License.
	Lei n. 11.428/2006, Dispõe sobre a utilização e proteção da vegetação nativa do Bioma Mata Atlântica,	Law regarding the use and protection of vegetation native to the Atlantic Forest and other areas. Associated legislation

Topic	Key EHS Regulation	Brief Description
	Brazil	
	e dá outras providências (Law n. 11.428/2006, Utilization and protection of vegetation native to the Atlantic Forest Biome, and other measures) Associated regulation/law: *Decreto n. 6.660/2008, Lei n. 12.651/2012, Lei n. 12.727/2012*	provides for the protection of native vegetation throughout Brazil while also establishing a Forest Code that regulates land use, logging, supply of raw forest materials, control to forest products, and the control and prevention of forest fires.
	Instrução Normativa SEMA/STC/CRS n. 01/1983 (Normative Ruling SEMA/STC/CRS n. 01/1983)	Outlines the conditions for storage and transportation of polychlorinated biphenyls (PCBs) and / or waste contaminated with PCB's.
	Decreto n. 24.643/1934, Decreta o Código de Águas (Decree n. 24.643, Water Code) Associated legislation: *Lei n. 852/1938*	The overarching Water Code of Brazil. Public waters need administrative concession or authorization for use while private property owners may utilize groundwater underneath their land so long as their private use does not jeopardize existing utilization of the water.
	Portaria MINTER n. 124/1980, Estabelece normas para a localização de indústrias potencialmente poluidoras junto à coleções hídricas (MINTER Decree n. 124/1980, Norms regarding the placement of industries that can potentially pollute waterways)	Prohibits the development of potentially polluting industries and/or buildings that store substances capable of causing water pollution less than 200 meters away from a waterway. The ordinance also requires the installation of control devices in locations that store pollutants.
	ABNT NBR n. 9.897/1987, Planejamento de amostragem de efluentes líquidos e corpos receptores – Procedimiento (ABNT NBR n. 9.897/1987, Procedure for the planning and sampling of liquid waste and the receptors)	Establishes the conditions required for the sampling of wastewater and water bodies.
	Resolução CNRH n. 16/2001 (CNRH Resolution n. 16/2001)	Establishes the procedures for applying for concession rights to use water resources.
	Resolução CNRH n. 54/2005, Estabelece modalidades, diretrizes e critérios gerais para a prática de reúso direto não potável de agua (CNRH Resolution n. 54/2005, Establishes rules, guidelines, and criteria for the general reuse of nonpotable wáter)	Establishes the general guidelines for the practice of direct re-use of non-potable water.

Topic	Key EHS Regulation	Brief Description
	Brazil	
	Resolução CONAMA n. 357/2005, Dispõe sobre a classificação dos corpos de água e diretrizes ambientais para o seu enquadramento, bem como estabelece as condições e padrões de lançamento de efluentes (CONAMA Resolution n. 357/2005, Classification of bodies of water and environmental guidelines for its framework with the conditions for effluent discharge) Associated regulation: *Resolução CONAMA n. 397/2008, Resolução CONAMA n. 430/2011*	Provides for the classification of water bodies and its corresponding environmental guidelines, including effluent discharge standards. Regulation defines the conditions, parameters, standards, and guidelines for effluent discharge management, requires the self-monitoring of effluents, and annual presentation of the Declaration of Pollution Load.
	Resolução CONAMA n. 396/2008, Dispõe sobre a classificação e diretrizes ambientais para o enquadramento das águas subterráneas (CONAMA Resolution n. 396/2008, Classification and environmental guidelines for groundwater)	Provides for the classification of groundwater and its corresponding environmental guidelines.
	Resolução CNRH n. 92/2008, Estabelece critérios e procedimentos gerais para proteção e conservação das águas subterrâneas no território brasileiro (CNRH Resolution n. 92/2008, Criteria and general proedcures to protect and conserve groundwater in Brazil)	Establishes the general criteria and procedures for the protection and conservation of groundwater in Brazil.
	Resolução ANA n. 833/2011 (ANA Resolution n. 833/2011)	Establishes the general requirements for preventative acts and the granting of use rights for water resources, along with fixed obligations to grant holders for dams.
	Portaria MINTER n. 53/1979 (MINTER Decree n. 53/1979)	Establishes standards for the disposal of solid waste and prohibits the use of soil as a destination for the final disposal of waste.
	ABNT NBR n. 11.174/1990	Defines Class II waste storage
	ABNT NBR n. 12.235/1992	Outlines methods for the temporary storage of hazardous solid waste
	Resolução CONAMA n. 275/2001, Estabelece código de cores para diferentes tipos de resíduos na coleta seletiva (CONAMA Resolution n. 275/2001, Establishes a color code for different types of waste for waste collection)	Establishes a color coding system for different types of waste that is to be used during collection and transport.

Topic	Key EHS Regulation	Brief Description
	Brazil	
	ABNT NBR n. 10.004/2004 , Resíduos Sólidos – Classificação (ABNT NBR n. 10.004/2004, Solid Waste Classifications)	Classifications of solid waste
	Lei n. 12.305/2010, Institui a Política Nacional de Resíduos Sólidos (Law n. 12.305/2010, National Policy on Solid Waste) Associated regulation: *Decreto 7.404/10*	Establishes the National Policy on Solid Waste, which outlines the guidelines regarding the integrated management of solid waste, including hazardous waste. The law also defines the responsibilities of corporations and the government.
Mining	*Lei n. 1985/1940, Código de Minas* (Law n. 1985/1940, Mining Code) Associated regulation/law: *Lei n. 227/1967, Decreto n. 62.934/1968, Lei n. 6.403/1976, Lei n. 7.805/1989, Decreto n. 98.812/1990, Lei n. 9.314/1996, Portaria DNPM n. 237/2001, Portaria DNPM n. 12/2002, Portaria DNPM n. 266/2008*	Overarching Mining Code for Brazil, as amended. Mining permits are granted through the National Department of Mineral Production and are valid for 5 years and may be renewed. Small-scale mining in urban areas is determined by the local administrative authority and all small-scale mines require an environmental license that must be obtained prior to requesting an operating permit.
	Decreto n. 875/1993, Pomulga o texto da Convenção sobre o Controle de Movimentos Transfronteiriços de Resíduos Perigosos e seu Depósito. (Decree n. 875/1993, Promulgates the text of the Convention on the Transboundary Movements of Hazardous Wastes Control and their Disposal)	Supports the Basel Convention on the control of transboundary movements of hazardous wastes and their disposal.
	ABNT NBR n. 13.030/1993, Elaboração e apresentação de projeto de reabilitação de áreas degradadas pela mineração (ABNT NBR n. 13.030/1993, Preparation and presentation of the rehabilitation of areas degraded by mining) Associated Regulation: *ABNT NBR n. 13.028/1993, ABNT NBR n. 13.029/1993*	Development and presentation of projects for the rehabilitation of areas damaged by mining. Associated regulation describes the procedures for the preparation and submission of tailings disposal projects and sterile waste dumps.
	Resolução CNRH n. 29/2002, Define diretrizes para a outorga deuso dos recursos hídricos para o aproveitamento dos recursos minerais (Resolution CNRH n. 29/2002, Guidelines for the use of water resources for mining activities)	Provides for the use of water resources related to mining activities.
	Lei n. 12.334/2010, Estabelece a Política Nacional de Segurança de Barragens (Law n. 12.334/2010, Establishes the National Dam Safety Policy) Associated regulation/law: *Resolução CNRH n.*	Establishes the National Dam Safety Policy which focuses on: the accumulation of water for all purposes; the final or temporary disposal of waste; and the accumulation of industrial waste. Associated regulations establish guidelines for implementation of the Policy, as well as classification of dams

Topic	Key EHS Regulation	Brief Description
	Brazil	
	144/2012, Resolução CNRH n. 143/2012	according to risk.
	Lei n. 9.433/1997, Institui a Política Nacional de Recursos Hídricos, cria o Sistema Nacional de Gerenciamento de Recursos Hídricos (Law n. 9.433/1997, National Water Resources Policy and the National System of Water Resources Management) Associated regulation: *Resolução CNRH n. 15/2001*	Establishes the National Water Resources Policy and the National System of Water Resources Management. Stipulates that actions in public waters must be authorized by the appropriate organization and establishes the charges for water use. Amended partially by Law 12.334/2010. The regulation stipulates that companies that run deep tube well drills need to register with the proper Regional Council of Energy and Agronomy (CREA – this is region-specific) and state agencies.
	Portaria MME n. 121/2011, Aprova o Plano Nacional de Mineração 2030 (MME Decree n. 121/2011, Approving the National Plan for Mining 2030)	Approves the National Mining Plan 2030
	Portaria DNPM n. 416/2012, Cria o Cadastro Nacional de Barragens de Mineração e dispõe sobre o Plano de Segurança, Revisão Periódica de Segurança e Inspeções Regulares e Especiais de Segurança das Barragens de Mineração (DNPM Decree n. 416/2012, Creates the National Register of Mining Dams and the Plan for Security, Periodic Safety Review, and Regular Inspections)	Creates the National Registry of Mining Dams and provides for two plans: the Plan for the Security, Periodic Safety Review and Regular Inspection and the Plan for Special Security of Mining Dams in line with Law 12.334.
	Lei n. 9.966/2000, Dispõe sobre a prevenção, o controle e a fiscalização da poluição causada por lançamento de óleo e outras substâncias nocivas ou perigosas em águas sob jurisdição nacional e dá outras providências. (Law n. 9.966/2000, Prevention, control, and monitoring of pollution caused by the discharge of oil and other harmful or dangerous substances in waters under national jurisdiction and other matters) Associated regulation: *Instrução Normativa IBAMA n. 06/2001, Portario n. 4136/2002*	Provides for the prevention, control and inspection of pollution by oil and other harmful and/or hazardous substances in waters under national jurisdiction.
Agri-Business	*Lei n. 8.171/1991, Lei da Política Agrícola* (Law n. 8.171/1991, Agricultural Policy)	Sets out the national policy on agriculture by defining the institutional objectives with regard to agricultural activities, industrial agriculture, and planning of fishing and forestry

Topic	Key EHS Regulation	Brief Description
	Brazil	
		activities.
Construction	*Resolução CONAMA n. 307/2002, Estabelece diretrizes, critérios e procedimentos para a gestão dos resíduos da construção civil* (CONAMA Resolution n. 307/2002, Guidelines, criteria, and procedures for the management of construction waste) Associated regulation: *CONAMA 431/11, CONAMA 448/12*	Establishes guidelines, criteria, and procedures for the management of construction waste in order to minimize environmental impacts.
	Occupational Health and Safety	
General	*Norma Regulamentadora Federal 16/1978, Atividades e Operações Perigosas* (Federal Regulation 16/1978, Dangerous Activities and Operations) Associated regulation: *Portaria SIT 312/12*	Norm responsible for regulating the health and safety standards of hazardous activities and/or operations
	Norma Regulamentadora Federal 20/1978, Líquidos combustíveis e inflamáveis (Federal Regulation 20/1978, Combustible and Flammable Liquids) Associated regulation: *Portaria SIT 308/12*	Norm responsible for regulating the storage conditions of flammable liquid fuels
	Norma Regulamentadora n. 15/1978, Atividades e operações insalubres (Regulatory Norm n. 15/1978, Unhealthy activities and operations) Associated regulation: *Portario SIT 43/08, Portario SIT 203/11, Portario SIT 291/11.*	Regulates those activities that are likely to result in levels of noise considered unhealthy for human receptors
	Resolução CONTRAN n. 168/2004, Estabelece Normas e Procedimentos para a formação de condutores de veículos automotores e elétricos, a realização dos exames, a expedição de documentos de habilitação, os cursos de formação, especializados, de reciclagem e dá outras providências (CONTRAN Resolution n. 168/2004, Norms and procedures for driver training for electric and automotive vehicles, the exams, the shipping and qualification of documents, training and retraining	Includes guidelines around: (i) the training requirements for drivers of motorized and electric vehicles; (ii) examination requirements; (iii) the issuance of qualification documents and training courses, both specialized and refresher courses.

Topic	Key EHS Regulation	Brief Description
	Brazil	
	courses, and other measures) Associated regulation: CONTRAN 74/98, CONTRAN 285/08, CONTRAN 347/10.	
	Portaria MINJUST n. 1.274/2003, Submete a controle e fiscalização os produtos químicos relacionados nas Listas I, II, III, IV e nos seus respectivos Adendos (MINJUST Decree n. 1.274/2003 Supervision and control of Schedule I, II, III, IV chemicals)	Provides for the control and supervision of chemicals by the Federal Police. The ordinance lists the chemicals controlled in Schedules I, II, III, IV and their respective addenda, listed in Annex I.
Mining	*Convenção OIT n. 176/1995, Dispõe sobre Segurança e Saúde nas Minas* (OIT Convention n. 176/1995, Safety and Health in Mines)	Health and safety regulations for mines.
	NRM-01, Normas gerais de mineração (NRM-01, General standards for mining)	General standards for productive, environmental sound, and safe mining
	NRM-02, Lavra a Céu Aberto (NRM-02, Open pit mining)	Open pit mines should be designed economically but also with operational safety, labor, and environmental control and rehabilitation in mind.
	NRM-04, Aberturas Subterrâneas (NRM-04, Underground openings)	Underground openings must be built and maintained safely during the period of their useful life.
	NRM-05, Sistemas de Suporte e Tratamento (NRM-05, Support and treatment systems)	All underground openings must be assessed and properly treated supported for their specific characteristics and purposes
	NRM-06, Ventilação (NRM-06, Ventilation)	Every mine must have a ventilation design and system that meets the appropriate standards.
	NRM-07, Vias e Saídas de Emergência (NRM-07, Emergency exits and routes)	Details the required emergency exits and routes that every mine must have.
	NRM-08, Prevenção contra Incêndios, Explosões, Gases e Inundações (NRM-08, Fire, explosión, gas and flood prevention)	Lists the procedures to prevent fires, explosions, gas leaks, and flooding
	NRM-09, Prevenção contra Poeiras (NRM-09, Dust prevention)	Lists maintenance requirements for equipment and dust control procedures, as well as monitoring of employee health related to dust exposure
	NRM-10, Sistemas de Comunicação	Mandates standard communications systems for use within

Topic	Key EHS Regulation	Brief Description
	Brazil	
	(NRM-10, Communication systems)	mines
	NRM-11, Iluminação (NRM-11, Lighting)	Mandates that lighting be required throughout working and transportation areas, as well as minimum lighting requirements
	NRM-12, Sinalização de Áreas de Trabalho e de Circulação (NRM-12, Signaling for work areas and circulation)	Lists the required areas and hazards that need to be marked for safety
	NRM-13, Circulação e Transporte de Pessoas e Materiais (NRM-13, Circulation and transport of people and materials)	Mandates a specific traffic plan within the mine to ensure vehicular and pedestrian safety
	NRM-14, Máquinas, Equipamentos e Ferramentas (NRM-14, Machinery, equipment, and tools)	Mandates that only authorized personnel operate equipment and safety procedures associated with automated equipment
	NRM-15, Instalações (NRM-15, Installations)	Instructions for the location of various installations within a mine as to their safest location
	NRM-16, Operações com Explosivos e Acessórios (NRM-16, Operations using explosives and other accessories)	All operations involving explosives must adhere to all safety regulations
	NRM-17, Topografia de Minas (NRM-17, Mine surveying)	Detailed maps are required for all parts of the mine
	NRM-19, Disposição de Estéril, Rejeitos e Produtos (NRM-19, Sterile disposal of waste and products)	Mines must have a Mining Plan that accounts for the proper disposal of waste
	NRM-20, Suspensão, Fechamento de Mina e Retomada das Operações Mineiras (NRM-20, Suspension, closure, and resumption of mining operations)	Suspension, closure and resumption of mining operations
	NRM-21, Reabilitação de Áreas Pesquisadas, Mineradas e Impactadas (NRM-21, Rehabilitation of areas that have been surveyed, mined, and impacted)	Rehabilitation of areas that have been surveyed, mined and impacted
	NRM-22, Proteção ao Trabalhador (NRM-22, Protecting the workforce)	Health and safety regulation for workers in mines
	Norma Regulamentadora n. 25/1978, Resíduos Industriais (Regulatory norm n. 25/1978, Industrial Waste) Associated regulation: *SIT 227/11, SIT 253/11*	Establishes standards for the disposal of waste in the workplace.

Topic	Key EHS Regulation	Brief Description
	Brazil	
Oil and Gas	*Resolução ANP n. 05/2008* (ANP Resolution n. 05/2008) Associated regulation: *Resolução ANP 54/11*	Adopts ABNT NBR-15514: 2007 to establish the safety criteria of storage areas for transportation containers for of liquefied petroleum gas intended or not for commercialization.
Agri-Business	*Portaria n. 86/2005, Aprova a Norma Regulamentadora de Segurança e Saúde no Trabalho na Agricultura, Pecuária, Silvicultura, Exploração Florestal e Aqüicultura* (Decree n. 86/2005, Regulatory norm of worker health and safety in agriculture, livestock, forestry, timber harvesting, aquaculture)	Establishes the principles that make worker health and safety in the workplace compatible with the planning and development of agricultural activities, livestock, forestry, forestry and aquaculture
	Community Health and Safety	
General	*ABNT NBR n. 12.649/1992, Armazenamento de resíduos sólidos perigosos – Procedimento* (ABNT NBR . 12.649/1991, Procedure for Hazardous Solid Waste Storage)	Characterization of pollutant loads in mining
	Decreto n. 79.367/1977, Dispõe sobre normas e o padrão de potabilidade de água e dá outras providências (Decree n. 79.367, Norms and Benchmark Standards for water potability and other measures)	Establishes that the Ministry of Health sets the rules and standards for drink water quality throughout the country, while also providing standards and regulations for water potability.
	ABNT NBR n. 13.969/1997, Tanques Sépticos - Unidades de tratamento complementar e disposição final dos efluentes líquidos - Projeto, construção e operação. (ABNT NBR n. 13.969/1997, Septic Tanks, Units for treatment and disposal of liquid effluents - Project, construction and operation)	Regulation concerning septic tank design, construction, and operation, with complementary plans and the final disposal of wastewater.
	Portaria MS n. 2.914/2011, Dispõe sobre os procedimentos de controle e de vigilância da qualidade da água para consumo humano e seu padrão de potabilidade (MS Decree n. 2.914/2011, Procedures for the control and surveillance of wáter quality for human consumption and its potability standards)	Establishes the potability standards for water intended for human consumption and outlines the procedures for the control and monitoring of water quality. Does not apply to natural mineral water, natural water, and added salt water intended for human consumption or to other waters used as raw material for preparation of products.
	ABNT NBR n. 13.221/2010, Transporte terrestre de	Establishes the requirements for inland transportation of waste.

Topic	Key EHS Regulation	Brief Description
	Brazil	
	residuos (ABNT NBR n. 13221/2010, Ground transport of waste)	
	ABNT NBR n. 10.152/1966	Establishes noise levels compatible with different environments and their corresponding "acoustic comfort". It does not exclude any other laws and/or recommendations regarding comfort conditions.
	Resolução CONAMA n. 01/1990, Dispõe sobre critérios de padrões de emissão de ruídos decorrentes de quaisquer atividades industriais, comerciais, sociais ou recreativas, inclusive as de propaganda política (CONAMA Resolution n. 01/1990, Criteria for noise emission arising from industrial, commercial, social or recreational activity, including political propoganda)	Establishes the guidelines necessary for complying with noise pollution parameters that originate from industrial, commercial, and/or recreational activities.
	ABNT NBR n. 10.151/2000, Acústica - Avaliação do ruído em áreas habitadas, visando o conforto da comunidade – Procedimento (ABNT NBR n. 10.151/2000, Evaluation of noise in inhabited areas aimed at community comfort	Establishes the requirements for assessing community noise, and specifies methods by which noise can be measured. A comparison against previous noise levels is provided along with an analysis of the different environmental factors that should be considered in populated areas.
	Decreto n. 96.044/1988, Aprova o Regulamento para o Transporte Rodoviário de Produtos Perigosos e dá outras providências (Decree n. 96.044/1988, Regulation for Road Transport of Dangerous Products and other measures) Associated regulation: *Decreto n. 4.097/2002*	Approves the regulation of road transport of hazardous products, outlining that those vehicles transporting hazardous goods should avoid the use of routes in densely populated areas, and routs near protected watersheds, water conservancy and/or forestry and ecological reserves.
	Resolução ANTT n. 420/2004, Aprova as Instruções Complementares ao Regulamento do Transporte Terrestre de Produtos Perigosos (ANTT Resolution n. 420/2004, Supplementary Instructions to the Regulation for Land Transport of Dangerous Goods) Associated regulation: *ANTT 1.644/06, ANTT 2.975/08, ANTT 3.383/10, ANTT 3.632/11, ANTT 3.648/11, ANTT 3.763/12.*	Approves supplementary instructions to regulations regarding the land transportation of hazardous products; and includes a list of those products that are considered hazardous when transported by road and/or rail. The resolution also establishes the requirements for the safe transportation of these products
	ABNT NBR n. 8.843/1996	Establishes procedures for solid waste management, and alternatives to be used during emergencies, in order to best preserve public health.

Topic	Key EHS Regulation	Brief Description
	Brazil	
	Decreto MAPA n. 30.691/1952, Aprova o novo Regulamento da Inspeção Industrial e Sanitária de Produtos de Origem Animal (MAPA Decree n. 30.691/1952, Industrial and Sanitary Inspections of Animal Products) Associated Regulation: *MAPA 8.444/15*	Establishes a system of inspections of animal products to ensure quality and safety for the community.
	Other Relevant Laws and Legislation[i]	
ESIA Process	*Resolução CONAMA n. 371/2006, Estabelece diretrizes aos órgãos ambientais para o cálculo, cobrança, aplicação, aprovação e controle de gastos de recursos advindos de compensação ambiental* (CONAMA Resolution n. 371/2006, Guidelines for environmental agencies to calculate, collect, apply, approve and control spending resources from environmental compensation)	Establishes the guidelines for calculating, collecting, using and controlling the financial resources arising from the environmental compensation due to environmental impacts cause by the development, as outlined in the Environmental Impact Assessment and Environmental Impact Report, and pursuant to art. 36 of law No. 9985/2000 and art. 31 of decree No. 4340/2002.
	Resolução CONAMA n. 01/1986, Dispõe sobre critérios básicos e diretrizes gerais para a avaliação de impacto ambiental (CONAMA Resolution n. 01/1986, Basic criteria and guidelines for an environmental impact assessment)	List the activities that will require the development of an Environmental Impact Assessment and its corresponding Environmental Impact Report, which must be submitted for approval by the relevant government authority and the Special Secretariat for the Environment.
Social Aspects	*Decreto n. 3.298/1999, Regulamenta a Lei no 7.853, de 24 de outubro de 1989, dispõe sobre a Política Nacional para a Integração da Pessoa Portadora de Deficiência, consolida as normas de proteção, e dá outras providências* (Decree n. 3.298/1999, Regulates Law n. 7.853, National Policy for the Integration of Persons with Disabilities, consolidates regulatory protections and other measures)	Establishes the National Policy for the Integration of Individuals with Disabilities, consolidates all other protection standards regarding individuals with disabilities and other provisions; a complement to law No. 7853/1989.
Cultural Heritage Aspects	*Lei n. 6.766/1979, Lei do parcelamento do solo urbano* (Law n. 6.766/1979, Urban land parceling Law)	Protected Areas or areas considered of cultural, historical, or archeological significance.
	Lei n. 25/1937, Organiza a proteção do patrimônio histórico e artístico nacional (Law n. 25/1937, Organizes the protection of archaeological and artistic national heritage)	Organizes protection of National Historical and Artistic Heritage while outlining what constitutes such heritage. This includes movable property and buildings whose conservation is in the public interest or is connected to memorable historical

[i] Note that the list in this subsection is not comprehensive and only lists the primary laws and legislation.

Topic	Key EHS Regulation	Brief Description
	Brazil	
		events, whose value is archaeologically, ethnographically, bibliographically, or artistically exceptional.
	Lei n. 3.866/1941, Dispõe sobre o tombamento de bens no Serviço do Patrimônio Histórico e Artístico Nacional (Law n. 3.866/1941, Preservation of goods to the Service of Historical Patrimony and National Arts)	Establishes the protection of national historical and artistic heritage.
	Lei n. 3.924/1961, Dispõe sôbre os monumentos arqueológicos e pré-históricos (Law n. 3.924/1961, Concerning Archaeological and Prehistoric Monuments)	Establishes that archaeological or prehistoric monuments of any kind are under the care and protection of the national government.
	Decreto Legislativo n. 74/1977, Aprova o texto da Convenção à Proteção do Patrimônio Mundial, Cultural e Natural (Legislative Decree n. 74/1977, Approves the Convention for the Protection of World Heritage, Cultural and Natural)	Approval of the Convention concerning the Protection of World Cultural and Natural Heritage
	Portaria IPHAN n. 230/2002 (IPHAN Decree n. 230/2002)	Establishes the procedures for obtaining licenses prior to the development and operations of projects that may impact cultural heritage.
Sustainable Finance	None identified	

Topics	Key EHS Regulation	Brief Description
	Mexico[ii]**	
	Environment	
General	*Ley General del Equilibrio Ecológico y la Protección al Ambiente - LGEEPA* (General Law for Ecological Equilibrium and Environmental Protection) Associated regulation: *Reglamento de LGEEPA en materia de Evaluación del Impacto Ambiental, Reglamento de LGEEPA en Materia del Registro Nacional de Emisiones, Reglamento de LGEEPA en Materia de Prevención y Control de Contaminación*	General law related to the protection, conservation and restoration of the environment. It is designed to provide support for the protection of the environment and biodiversity, with related penal, administrative and other associated regulations. Associated regulation sets the process for submitting Environmental Impact Assessments and defines jurisdiction, defines what sectors are subject to reporting greenhouse gas emissions, establishes jurisdiction of air emissions sources for fixed and mobile emission holders, and stipulations for the Emissions Register.

[ii]** The key sector of Infrastructure has been left out of this table due to its incredible complexity at even the federal level of legislation. It is highly recommended that local experts be employed when work is done in this sector.

Topics	Key EHS Regulation	Brief Description
	Mexico[ii]**	
	de la Atmósfera, Reglamento de LGEEPA Materia de Registro de Emisiones y Transferencia de Contaminantes	
	NOM-022-SEMARNAT-2003	Establishes the conservation specifications in mangrove areas.
	NOM-059-SEMARNAT-2010	Sets a list of protected species and their conservation status. In case of projects located within Natural Protected Areas (NPAs) or Natural Parks, it establishes the applicable Management Plans.
	NOM-149-SEMARNAT-2006	Sets the specifications for environmental protection to be observed during the stages of drilling, maintenance and abandonment of oil wells in marine areas in order to prevent and mitigate environmental impacts
	Primer y Segundo Listado de Actividades Altamente Riesgosas (First and Second List of Highly Risky Activities)	Establishes a list of substances that are considered hazardous and sets the threshold according to the maximum storage capacity, establishing criteria that trigger the submittal of an Environmental Risk Assessment at Federal level
	Ley General de Cambio Climático (General Law for Climate Change)	Sets provisions to address the effects of climate change based on environmental protection, sustainable development, preservation and restoration of ecological balance, regulating emissions of greenhouse gases and compounds to stabilize their concentrations in the atmosphere.
	NOM-085-SEMARNAT-2011	Maximum emission permissible limits for smoke, total suspended particulates, carbon monoxide (CO), sulfur dioxide (SO_2) and nitrogen oxides (NOX) from fuel-burning equipment. Establishes methods and frequencies of monitoring) and the emission limits in accordance of their location within the country.
	NOM-043-SEMARNAT-1993	Maximum emission permissible levels for particulate matter generated by fixed emission sources.
	NOM-165-SEMARNAT-2013	Sets the list of chemical substances and contaminants subject to report and establishes the threshold from their use and/or transference/emission to the environment.
	Ley de Aguas Nacionales - LAN *(*General Water Law*)*	Sets programming and planning of water resources, establishes the allowed uses of national waters, user's obligations, wastewater discharge into national waters or soil and water extraction (underground or surface).
	Reglamento para Prevenir y Controlar la Contaminación del Mar por Vertimiento de Desechos y Otras Materias (Regulation to Prevent and Control Sea Pollution from Waste Discharges)	States the prevention measures to avoid sea contamination from wastewater discharge activities.

Topics	Key EHS Regulation	Brief Description
	Mexico[ii]**	
	NOM-001-SEMARNAT-1996	Sets the maximum discharge limits and the sampling frequency in accordance with the operation of the discharge
	NOM-002-SEMARNAT-1996	Establishes the maximum permissible levels for contaminants in wastewater discharges to urban and municipal sewage systems.
	Ley General para la Prevención y Gestión Integral de los Residuos - LGPGIR (Federal Waste Law) Associated regulation: *Reglamento de la Ley General para la Prevención y Gestión Integral de los Residuos*	Sets waste classification and prevention strategies, and integrates the strategies of general waste management, hazardous waste management and generation, import and export of hazardous waste, and solid waste management
	NOM-052-SEMARNAT-2005	Sets the procedure for identifying whether a waste is hazardous. Also defines tests and analysis to determine the degree of hazard.
Mining	*Ley Minera* (Mining Law) Associated regulation: *Reglamento de la Ley Minera*	Regulates the management and control of the mining sector in accordance with the principles of sustainability, precaution, prevention and efficiency.
Oil and Gas	*Ley de Hidrocarburos* (Federal Hydrocarbons Law)	Sets exploration and production allocation targets, exploration and production agreements, authorizations, obligations, procedures and requirements for hydrocarbon sector activities.
	Ley de la Agencia Nacional de Seguridad Industrial y de Protección al Medio Ambiente del Sector Hidrocarburos (Law of the National Agency for Environmental Protection, Health and Safety for the Hydrocarbons Sector) Associated regulation: *Reglamento de la Ley de Hidrocarburos*	Sets the general requirements for environmental protection, health and safety for projects and activities in the O&G sector derived from the Federal Hydrocarbons Law. Establishes the activities and scope of the National Hydrocarbons Agency.
Agri-Business	*Ley General de Desarrollo Forestal Sustentable* (Forestry Sustainable Development General Law)	Sets the requirements to regulate and promote the conservation, protection, restoration, production, management, cultivation, management and use of forest ecosystems within the country and its resources, and establishes the levels of jurisdiction.
	Ley de Productos Orgánicos (Organic Products Law)	Promotes and regulates the criteria and/or requirements for conversion, production, processing, preparation, conditioning, storage, identification, packaging, labeling, distribution, transport, marketing, verification and certification of organically produced products.

Topics	Key EHS Regulation	Brief Description
	Mexico[ii]**	
	Reglamento en Materia de Registros, Autorizaciones de Importación y Exportación y Certificados de Exportación de Plaguicidas, Nutrientes Vegetales y Sustancias y Materiales Tóxicos o Peligrosos (Regulation on Registration, Import authorization and Export Certificates for Pesticides, Fertilizers, Toxic Substances and Hazardous Materials)	Sets the requirements and procedures under which the relevant Secretariats (Health, Environment, Sanitary Risks) shall regulate registers, import and export licenses and export certificates, pesticides, plant nutrients and toxic or hazardous substances and materials.
	Occupational Health and Safety	
General	*Ley Federal del Trabajo* (Federal Labor Law) Associated regulation: *Reglamento Federal de Seguridad y Salud en el Trabajo*	Regulates labor conditions ranging from contractual to workplace environment, including: payment, work days, vacations, workplace conditions, safety and hygiene.
	NOM-001-STPS-2008	Sets general requirements for workplace health and safety conditions (i.e. floors, ramps, walls, buildings)
	NOM-002-STPS-2010	Establishes the requirements for fire protection conditions, installations and safety measures and procedures.
	NOM-004-STPS-1999	Sets conditions for safe operation of machinery and equipment and the implementation of safety devices and safety guards
	NOM-005-STPS-1998	Sets safety conditions for management, transport and storage of hazardous chemical substances.
	NOM-006-STPS-2014	Establishes safety procedures for the management and storage of materials.
	NOM-009-STPS-2011	Sets safety conditions and requirements to conduct work at heights
	NOM-010-STPS-1999	Sets safety conditions to recognize, monitor and control contaminants and chemical agents
	NOM-011-STPS-2001	Sets conditions for noise levels
	NOM-012-STPS-2012	Establishes safety criteria for ionizing radiation exposure
	NOM-013-STPS-1993	Establishes safety criteria for non-ionizing radiation exposure
	NOM-014-STPS-2000	Establishes safety criteria for abnormal pressure exposure
	NOM-015-STPS-2001	Sets health and safety conditions, and maximum permissible levels of exposure times to extreme thermal conditions that may alter the health of workers.
	NOM-017-STPS-2008	Establishes safety requirements for PPE selection and management
	NOM-018-STPS-2000	Sets the criteria and procedures for the safe handling of hazardous substances including hazards communications and MSDS.

Topics	Key EHS Regulation	Brief Description
	Mexico[ii]**	
	NOM-019-STPS-2011	Establishes the requirements for the establishment, composition, organization and functioning of health and safety committees
	NOM-020-STPS-2011	Sets safety criteria for installation and operation of pressure vessels.
	NOM-022-STPS-2008	Establishes safety requirements for static electricity at workplace including environment conditions as lightning.
	NOM-025-STPS-200	Sets lighting requirements
	NOM-026-STPS-2008	Establishes the requirements concerning health and safety colors, signs and risks signaling from fluids conducted in pipes.
	NOM-027-STPS-2008	Establishes health and safety conditions to prevent hazards during welding and cutting activities.
	NOM-028-STPS-2012	Stipulates that facilities that manage chemical substances in quantities above regulated levels must implement a process safety management system.
	NOM-029-STPS-2011	Sets safety conditions and requirements to perform maintenance activities in electrical installations.
	NOM-030-STPS-2009	Establishes requirements for preventive health services
	NOM-031-STPS-2011	Set the requirements for health and safety conditions during construction
	Ley General de Protección Civil (LGPC) General Civil Protection Law Associated regulation: *Reglamento de Ley General de Protección Civil*	Establishes the foundations of coordination between the federal, state and municipal jurisdictions in civil protection matters. Regulation sets the coordination and procedure mechanisms for the public and private sectors/industries.
Mining	*NOM-023-STPS-2012*	Establishes minimum requirements for health and safety conditions to prevent workers from risks in underground and open pit mines.
	NOM-032-STPS-2008	Establishes requirements for health and safety conditions to prevent workers from risks in coal mines.
Oil and Gas	*NOM-005-STPS-1998*	Sets safety conditions for management, transport and storage of hazardous chemical substances.
	NOM-010-STPS-1999	Sets safety conditions to recognize, monitor and control contaminants and chemical agents
Agri-Business	*NOM-003-STPS-1999*	Establishes health and safety conditions to prevent risks to which workers are exposed on storing, handling, transferring and application of fertilizers or pesticides
	NOM-007-STPS-2000	Sets safety conditions of facilities, machinery, equipment and tools used in agricultural activities to prevent risks.
	NOM-045-SSA1-1993	Establishes the characteristics that must be included on the

Topics	Key EHS Regulation	Brief Description
	Mexico[ii]**	
		labels of pesticides for agriculture and forestry, livestock, gardening, urban and industrial use.
	NOM-EM-034-FITO-2000	Sets the requirements and specifications for the implementation and certification of Good Agricultural Practices in the production processes of fresh fruits and vegetables.
	NOM-037-FITO-1995	Establishes the basis for the certification of production processes and processing of organic agricultural products.

Other Relevant Laws and Legislation[iii]		
ESIA Process	*Reglamento de la Ley General del Equilibrio Ecológico y la Protección al Ambiente en Materia de Evaluación del Impacto Ambiental* (Regulation of the General Environmental Law in terms of Environmental Impact)	Sets the process for submitting the Environmental Impact Assessment and defines jurisdiction (Federal or State) of the projects and activities.
Social Aspects	*Ley General de Desarrollo Social* (General Law of Social Development)	Establishes obligations and institutions of social development; sets specific actions to promote economic development, including social participation and mechanisms for evaluation and follow up procedures
	Ley de Hidrocarburos (Federal Hydrocarbons Law) Associated regulation: *Reglamento de la Ley de Hidrocarburos*	Sets as a requirement for oil projects to conduct a Social Impact Assessment. The regulation establishes the requirements and guidelines that shall be included on the Social Impact Assessment.
Cultural Heritage Aspects	*Ley Federal sobre Monumentos y Zonas Arqueológicas, Artísticas e Históricas* (Federal Law on Monuments, Archaeological, Artistic and Historical Sites)	Sets the principles for the protection, conservation, restoration and recovery of archaeological, artistic and historic monuments and monument zones.
	Reglamento de la Ley Federal sobre Monumentos y Zonas Arqueológicas, Artísticas e Históricas (Federal Law on Monuments, Archaeological, Artistic and Historical Sites)	Establishes requirements and conditions to preserve areas or monuments and authorize any activity in areas of cultural value.
	Ley de Hidrocarburos (Federal Hydrocarbons Law)	Establishes the requirement of conducting a public survey to include interests and rights of the communities and indigenous

[iii] Note that the list in this subsection is not comprehensive and only lists the primary laws and legislation.

		population.
Sustainable Finance	*Ley de Desarrollo Rural Sustentable* (Rural Sustainable Development Law)	This Law includes conditions of planning and organization of agricultural production, industrialization and marketing, and other goods and services, in order to improve rural communities.
	Ley de Capitalización del Programas de Apoyos Directos al Campo (PROCAMPO) (Law for the Capitilization of Direct Support of the Countryside)	Sets provisions for early access and use as guarantee of future payments to eligible beneficiaries of the Program of Direct Support of Countryside.
	Ley para el Desarrollo de la Competitividad de la Micro, Pequeña y Mediana Empresa (Law for the Development of the Competitiveness of Micro, Small and Medium Enterprises	This Law promotes national economic development by promoting the creation of micro, small and medium enterprises and support for its viability, productivity, competitiveness and sustainability.

Topic	*Key Regulation*	*Brief Description*
Peru		
Environment		
General	*Ley No. 28611, Ley General del Ambiente, modificado por el D.L. No. 1055 y Ley No. 29263* (General Environmental Law, modified by Legislative Decree 1055) Associated regulation/law: *D.S. 032-2005-MTC, D.S. 002-2006-EM, D.S. 015-2006-EM, D.S. 007-2006-VIVIENDA, Consejo Directivo 010-2006-CONAM-CD, Consejo Directivo 011-2006-CONAM-CD, Ley 28804, Ley 28852, R.M. 198-2006-PRODUCE, Consejo Directivo 016-2006-CONAM-CD, R.N. 360-2006-SUNARP-SN*	The environmental operating standard in Peru. Its regulation is designed to protect the environment through actions addressed during the development of all human activity. At the same time, it establishes basic principles to guarantee a healthy and balanced ecosystem.
	Decreto Supremo No. 012-2009-MINAM, Norma que Aprueba la Política Nacional Ambiental (Regulation approving the National Environmental Policy)	State guidelines regarding National Environmental Policy.
	Ley No. 27117, Ley General de Expropiaciones (General Law for Expropriations)	Establishes the mechanisms for expropriation that include restitution and compensation for eventual damages.
	Ley NO. 27314, Ley General de Residuos Sólidos (General Law for Solid Waste) Associated Regulation: *D.L. 1065, D.S. 057-2004-PCM*	The law establishes the rights, obligations, powers, and responsibilities of society for the management of solid waste with the objective of minimizing waste, protection of health and well-being, and lowering environmental hazards.

Topic	Key Regulation	Brief Description
	Peru	
	Decreto Supremo No. 074-2001-PCM, Reglamento de Estándares Nacionales de Calidad Ambiental del Aire (Regulation of National Standards of Environmental Air Quality, as modified) Associated regulation: *D.S. 069-2003-PCM, D.S. 003-2008-MINAM, D.S.006-2013-MINAM, D.S. 074-2001-PCM*	Regulation establishes the parameters of certain compounds (SO_2, CO, NO_2, O_3, Pb, H_2S, benzene, total hydrocarbons, and particulates smaller than 2.5 microns) in the atmosphere.
	Decreto Supremo No. 002-2013-MINAM, Estándares de Calidad Ambiental para Suelo (Environmental Quality Standards for Soils) Associated Regulation: *D.S. 002-2014-MINAM*	These standards apply to any project that generates, or has the potential to generate, risks of soil contamination within the project and its area of influence. The regulation makes obligatory environmental management plans that include plans for decontamination.
	Ley No. 28551, Ley que establece la obligación de elaborar y reasentar Planes de Contingencias (Law that establishes the obligation to formulate and resettle Contingency Plans)	Law that indicates that all people who maintain public or private businesses, buildings, operations or installations have to obtain approval for their contingency plans before the proper authority for each of their development operations.
	Ley No. 26821, Ley Orgánica para el Aprovechamiento Sostenible de los Recursos Naturales (Law for the Sustainable Utilization of Natural Resources)	Establishes the conditions for the sustainable use of natural resources. Further, it stipulates that the owner of a project has to develop and complete an Environmental Management Plan.
	Ley No. 26839, Ley de Conservación y Aprovechamiento Sostenible de la Diversidad Biológica (Law for the Conservation and Sustainable Utilization for Biological Diversity) Associated Regulation: *D.S. 068-2001-PCM*	Establishes the conservation of biological diversity and the sustainable utilization of its components, along with the regulations for such activities associated with development.
	Ley No. 27308, Ley Forestal y de Fauna Silvestre (Forest and Wild Fauna Law) Associated regulation: *D.S. 004-2014-MINAGRI, D.S. 014-2001-AG*	The Law indicates the State promotes the management of forest and wild fauna and establishes the norms for their conservation and the regimen for their use and the commercialization of associated products. The regulation stipulates that threatened species that are protected at the global level are protected within Peru.
	Decreto Supremo No. 009-2013-MINAGRI, Política Nacional Forestal y de Fauna Silvestre (National Policy on Forests and Wild Fauna)	National forest and wild animal policy to provide for adequate management of the forest patrimony and wild animals of the State, to assure their sustainable use, conservation, and protection.

Topic	Key Regulation	Brief Description
	Peru	
	Decreto Supremo No. 034-2004-AG, Categorización de Especies amenazadas de Fauna Silvestre y prohíben su caza, transporte o exportación con fines comerciales (Categorization of threatened species of wild fauna, and prohibition against their hunting, transport or export with commercial fines)	Identifies threatened and endangered species within Peru according to family and order, and prohibits their being hunted, transported or exported with commercial fines if caught.
	Decreto Supremo No. 043-2006-AG, Categorización de Especies amenazadas de Flora Silvestre (Categorization of threatened Species of Wild Flora)	Identifies threatened and endangered species within Peru according to family and order.
	Ley No. 29338, Ley de Recursos Hídricos (Law concerning Water Resources) Associated regulation: *D.S. 001-2010-AG*	The law and regulations stipulate the proper use and management of water resources, and the classifications of those resources.
	Decreto Supremo No. 047-2001-MTC, Límites Máximos Permisibles de emisiones contaminantes para vehículos automotores que circulen en la red vial (Maximum Permissable Emissions Limits for automotive vehicles that travel on the highway system)	Establishes the Permissible Maximum Limits (LMPs) of contaminating emissions for vehicles in use, new imported vehicles, vehicles built in the country, and used imported vehicles.
	Ley No. 26834, Ley de Áreas Naturales Protegidas (Law for Natural Protected Areas) Associated regulation: *D.S. 038-2001-AG, D.S. 003-2011-MINAM, D.S. 016-2009-MINAM*	Protection for Natural Protected Areas and its associated regulations and manuals.
	Resolución Ministerial No. 225-2010-MINAM, Aprueban Plan de Estándares de Calidad Ambiental (ECA) y Límites Máximos Permisibles (LMP) (Plan for Environmental Quality Standards and Maximum Permissible Limits)	Policy regarding Environmental Quality Standards (ECA) and Maximum Permissible Limits (LMP)
	Decreto Supremo No. 013-99-AG, Prohíben Caza, Extracción, Transporte y/o Exportación con Fines Comerciales de Fauna Silvestre (Prohibits the Hunting, Extraction, Transport, and/or Export of Wild Fauna with Commercial Fines)	Regulation that prohibits the hunting, extraction, transport and/or export of wild fauna. Commercial fines are applicable if caught.
	Decreto Ley No. 21080, Convenio sobre el comercio internacional de especies amenazadas de fauna y flora silvestre (Convention on the international trade of endangered	National accord concerning the protection of endangered plants and wildlife and prohibiting their international trade.

Topic	Key Regulation	Brief Description
	Peru	
	flora and fauna)	
Mining	*Ley No. 28271, Ley que Regula los Pasivos Ambientales, modificado por D.L. No. 1042* (Law Regulating Environmental Liabilities, as modified) Associated regulation: *D.S. 059-2005-EM, D.S. 003-2009-EM*	Regulates environmental liabilities associated with mining activities and the responsibility and financing for the remediation of affected areas. The Law is designed with the intent to mitigate negative effects to the health of the population, the ecosystem, and property.
	Resolución Ministerial No. 121-2013-MINAM, La Guía para la Evaluación del Instrumento de Gestión Ambiental Correctivo – IGAC (Guide for the Evaluation of the Instrument of Corrective Environmental Management)	The legislative guide is for evaluating, monitoring and mitigating environmental impacts for small-scale and artisanal mining operations. This is designed to minimize discretion and to ensure that the evaluation process consistently meets the same standards and quality.
	Decreto Supremo, 029-94-EM, Reglamento de Protección Ambiental en las Actividades Eléctricas (Regulation for Environmental Protection during Electrical Endeavors)	Regulation that standardizes the interactions between generation, transmission, and distribution systems and the environment, under the concept of sustainable development.
	R.M. 366-2001-EM/VME, Código Nacional de Electricidad (National Electrical Code)	Law designed to safeguard people and installations during the construction, operation, and maintenance of electrical lines, electrical supply, and communications equipment without affecting public or private property, the environment, or cultural patrimony.
	R.M. No. 315-96-EM/VMM, Niveles Máximos Permisibles de Elementos y Compuestos Presentes en Emisiones Gaseosas Provenientes de las Unidades Minero-Metalúrgicas (Maximum Permissible Levels of elements and attendant compounds in gaseous emissions from the Mining-Metallurgical Levels)	Establishes the maximum permissible levels of elements and compounds in emissions associated with mining and metallurgical activities.
	R.M. No. 011-96-EM/VMM, Niveles Máximos para Efluentes Líquidos de las Actividades Minero-Metalúrgicas (Maximum Permissible Limits of liquid effluent for Mining-Metallurgical Activities) Associated regulation: *D.S. 010-2010-MINAM*	Establishes the maximum permissible limit for liquid effluents in the mining and metallurgical subsectors.
Oil and Gas	*Ley No. 29134, Regula los Pasivos Ambientales del Subsector Hidrocarburos* (Regulating the Environmental Liabilities of the	The law regulates the management of environmental liabilities for the hydrocarbon subsector with the aim of reducing or eliminating their negative impacts on health,

Topic	Key Regulation	Brief Description
	Peru	
	Hydrocarbon Subsector) Associated Regulation: *D.S. 004-2011-EM*	within the population, the ecosystem, and the land.
	Ley 26221, Ley Orgánica de Hidrocarburos (Law for Hydrocarbons) Associated regulation: *D.S. 042-2005-EM*	Overarching law concerning activities surrounding hydrocarbons.
	Decreto Supremo No. 014-2010-MINAM, Límites Máximos Permisibles para las Emisiones Gaseosas y de Partículas de las Actividades del Sub Sector Hidrocarburos	Establishes the maximum permissible levels of elements and compounds in emissions associated with the hydrocarbon subsector.
	Decreto Supremo No. 039-2014-EM, Reglamento de Protección Ambiental en las Actividades de Hidrocarburos (Regulation for Environmental Protection in Activities associated with Hydrocarbons) Associated regulation: *D.S. 015-2006-EM*	Environmental protection for all of the activities associated with hydrocarbons.
	Decreto Supremo No. 037-2008-PCM, Establecen Límites Máximos Permisibles de Efluentes Líquidos para el Subsector Hidrocarburos (Establishes Maximum Permissible Limits of liquid effluent for the Hydrocarbon Subsector)	Establishes the maximum permissible limit for liquid effluents in the hydrocarbon subsector.
Infrastructure	*R.D. Nº 03-2013- MTC/14, Manual de Carreteras "Especificaciones Técnicas Generales para Construcción"* (Manual of Highways "General Technical Specifications for Construction")	Contains the conditions, legal requirements, parameters, and procedures for activities relating to works of infrastructure.
	Decreto Supremo 037-96-EM, Aprovechamiento de Canteras de Materiales de Construcción (Utilization of Quarries for Construction Materials) 利用采石场生产建材	Quarries for construction materials used exclusively for infrastructure projects developed by the State directly or through a contractor have to be located within a radius of 20 km or within 6 km on either side longitudinally of the project.
	Occupational Health and Safety	
General	*Ley No. 29783, Ley de Seguridad y Salud en el Trabajo* (Law for Safety and Health in the Workplace) Associated Regulation: *D.S. 005-2012-TR*	Generalized occupational health and safety law for all sectors and all employed individuals for the prevention of workplace hazards. Managing health and safety in the workplace is the responsibility of the employer, who assumes the leadership and the commitment to these activities within the

Topic	Key Regulation	Brief Description
	Peru	
		organization.
	Decreto Supremo No. 015-2005-SA, Reglamento sobre Valores Límite Permisibles para Agentes Químicos en el Ambiente de Trabajo (Regulation concerning acceptable values for chemical agents in the air at the workplace)	Established limits for air contaminants at work to ensure the safety and health of workers in every occupation.
	R.D. No. 128-2001-EM, Fiscalización de Seguridad (Safety Audits)	Regulation providing for safety audits within the workplace.
Mining	*Decreto Supremo No. 055-2010-EM, Reglamento de Seguridad y Salud Ocupacional y otras medidas complementarias en minería* (Occupational Safety and Health Regulations and Complementary Measures in Mining) Associated regulation: *D.S. 060-2010-EM*	Occupational health and safety regulations specific to mining
Oil and Gas	*Decreto Supremo No. 043-2007-EM, Reglamento de Seguridad para la Actividad de los Hidrocarburos* (Safety Regulation for Hydrocarbon Activity)	Safety regulation for those operating in the petroleum subsector.
	Decreto Supremo No. 032-2004-EM, Regulamento de las Actividades de Exploración y Explotación de Hidrocarburos (Regulation for Explorative and Exploitative Activities of Hydrocarbons)	Regulations regarding all activities surrounding the exploration and exploitation of hydrocarbons, with sections for health and safety of employees.
	Decreto Supremo No. 052-93-EM, Reglamentos de Seguridad para el Almacenamiento de Hidrocarburos (Regulation for Security during the Storage of Hydrocarbons)	Worker safety regulation regarding the safe storage of hydrocarbons.
	Decreto Supremo No. 026-94-EM, Reglamentos de Seguridad para el Transporte de Hidrocarburos (Safety Regulations for Transporting Hydrocarbons)	Worker safety regulations for the safe transport of hydrocarbons.
	R.N. 191-2011-OS/CD, Reglamento del Registro de Hidrocarburos (Regulations for the Registration of Hydrocarbons)	Regulation regarding the registration of hydrocarbons.
	Community Health and Safety	
General	*Ley. No. 26842, Ley General de Salud* (General Law for Health)	The law establishes that the protection of the environment is the responsibility of the State and its citizens, who have an obligation to follow established standards in order to preserve the health of the people.

Topic	Key Regulation	Brief Description
	Peru	
	Decreto Supremo N° 002-2008-MINAM, Estándares Nacionales de Calidad Ambiental para Agua (National Standards for Water Quality) Associated Regulation: *D.S. 023-2009-MINAM, D.S. 031-2010-SA*	Regulation establishes the parameters of acceptable concentrations of chemicals and biological agents in the water, on the condition that those concentrations do not represent a significant risk to the health of persons or the environment.
	Decreto Supremo N° 085-2003-PCM, Reglamento de Estándares de Calidad Ambiental para Ruido (Regulation of Standards for Environmental Quality regarding Noise)	Regulation establishes the parameters regarding acceptable outside noise levels within applicable zones and schedules for the protection of human and environmental health.
	Decreto Supremo N° 010-2005-PCM, Estándares de Calidad Ambiental para Radiaciones No Ionizantes (Environmental Quality Standards for non-ionizing radiation)	The regulation establishes maximum levels for non-iodizing radiation levels and recognizes that its presence in the environment is harmful to the health of people and ecosystems. These standards are considered foremost for the protection of human life.
	Ley No. 28256, Ley que regula el Transporte Terrestre de Materiales y Residuos Peligrosos (Law Regulating the Ground Transport of Hazardous Materials and Waste) Associated Regulation: *D.S. 021-2008-MTC, D.S. 030-2008-MTC*	Establishes what materials and wastes are hazardous, what states (gas, liquid, solid) they are hazardous in, what mixtures are hazardous, etc. Establishes the norms and procedures of the activities, processes and operations surrounding their transport to prevent spills and protect people, the environment, and property.
	Decreto Supremo No. 021-2012-AG, Reglamento de Organizaciones de Usuarios de Agua (Regulation for the Organizations of Water Users)	Recognizes that every person has a right to water as guaranteed by the National Water Authority. Stipulates that water use needs to be efficient in terms of quality, quantity, and opportunity, and that these needs need to be met without affecting a third party. Water should be used with its conservation, maintenance, and the development of the water basin in mind.
	Resolución Jefatural No. 0291-2009-ANA, Disposiciones referidas al otorgamiento de Autorizaciones de vertimiento y de reuso de aguas residuales tratadas (Provisions referring to the management of Authorizations of discharge and reuse of treated wastewater) Associated Regulation: *R.J. 224-2013-ANA, R.J. 351-2009-ANA*	Contains the management provisions for the discharge and reuse of treated wastewater, either of industrial, domestic, or municipal origin. It also includes classifications of bodies of water, limit values for contaminants, and the costs for inspections and evaluations. Associated regulation includes the administrative procedures to obtain authorizations.

Topic	*Key Regulation*	*Brief Description*
	Peru	
	Resolución Jefatural No. 579-2010-ANA, Reglamento de Procidiementos para el Otorgamiento de Derechos de Uso de Agua (Regulation of the Procedures for Granting of Water Use Rights) Associated regulation: *R.J. 297-2011-ANA*	Regulation regarding the application and administration of water use rights.
	Ley No. 28305, Ley de Control de Insumos Químicos y Productos Fiscalizados (Law for the Control of Precursor Chemicals and Controlled Substances) Associated regulation: *D.S. 30-2009-PRODUCE, D.S. 053-2005-PCM*	Law and regulations concerning the control of precursor chemicals and controlled substances, in order to better control and inspect these chemicals from import, to production, to export.
Other Relevant Laws and Legislation[iv]		
ESIA Process	*Ley No. 27446, Ley del Sistema Nacional de Evaluación de Gestión Ambiental, modificado por D.L. No. 1078* (Law of the National System of Evaluations for Environmental Management, as modified) Associated regulation: *D.S. 019-2009-MINAM*	Overarching national law that establishes a uniform process of identification, prevention, supervision, control, and anticipated correction of negative environmental impacts stemming from human actions. Establishes the mechanisms to assure citizen participation in the evaluation process.
	Ley No. 29325, Sistema Nacional de Evaluación y Fiscalización Ambiental (National System for Environmental Evaluation and Audit)	Establishes a national system for environmental assessments, in accordance with Laws 28245 and 28611 (Framework of the National System of Environmental Management and General Law on the Environment). This guarantees the functions of evaluation, supervision, audit, control and legal authority of the environment to the various parts of the State.
	Resolución Jefatural No. 250-2013-ANA, Términos de Referencia comunes del contenido hídrico para la elaboración de Estudios Ambientales (Terms of Reference on the subject of water for the elaboration of Environmental Studies) Associated regulation: *R.J. 508-2013-ANA*	Establishes the necessary topics regarding water that need to be considered in the Terms of Reference Section in Environmental Impact Studies.

[iv] Note that the list in this subsection is not comprehensive and only lists the primary laws and legislation.

Topic	Key Regulation	Brief Description
	Peru	
	R.V.M.1079-2007- MTC/02, Lineamientos para la Elaboración de los Términos de Referencia de los Estudios de Impacto Ambiental para Proyectos de Infraestructura Vial (Guidelines on the Elaboration of the Terms of Reference for Environmental Impact Studies on Road Infrastructure)	Environmental and social aspects are listed that need to be considered within the Environmental Implementation that applies to the project.
	Resolución Directoral No. 006-2004- MTC-16, Reglamento de Consulta y Participación Ciudadana en el Proceso de Evaluación Ambiental y Social en el Subsector Transportes (Regulation on Citizen Consultation and Participation in the Environmental and Social Evaluation Process in the Transportation Subsector)	Regulation that sets the guidelines for involving people who are involuntary involved with a project within the Transportation Subsector. It requires discussion and disclosure of information with these people in order to better the process of decision making involved with these projects.
	Directoral No. 030 2006- MTC/16, Guía Metodológica de los Procesos de Cultura y Participación Ciudadana en la Evaluación Ambiental y Social-Subsector Transportes Resolución *(Methodological Guide to the Processes of Culture and Citizen Participation in Social and Environmental Evaluations in the Transportation Subsector)*	Outlines the conditions, requirements, parameters, and procedures for activities related to infrastructure projects with that idea that standardizing these steps will lead to better indices regarding the quality of the project.
	Ley No. 28090, Ley que Regula el Cierre de Minas (Law regulating Mine Closures) Associated regulation: *D.S. 033-2005-EM*	Contains the obligations and procedures that mine owners have to have contained within their Mine Closure Plan to guarantee the protection, preservation, and recuperation of the environment in order to mitigate the negative impacts to the health of the local people, the surrounding ecosystem, and property.
	Decreto Supremo No. 028-2008-EM, Reglamento de Consulta y Participación Ciudadana en el Subsector minero (Regulation for Consultation and Citizen Participation in the Mining Subsector) Associated regulation: *R.M. 304-2008-EM/DM*	Regulation that sets the guidelines for involving people who are involuntary involved with a project within the Mining Subsector. It requires discussion and disclosure of information with these people in order to better the process of decision making involved with these projects.
	Ley 29325, Ley del Sistema Nacional de Evaluación y Fiscalización Ambiental, modificado por Ley 30011 (Law for the National System of Environmental Evaluation and Auditing, as modified)	Environmental monitoring and auditing law for activities related to mining, electricity, and hydrocarbons.
Social	*Ley No. 27811, Ley que establece el régimen de*	Law that protects knowledge and native culture, and the

Topic	Key Regulation	Brief Description
	Peru	
Aspects	*protección de los conocimientos colectivos de los Pueblos Indígenas vinculados a los Recursos Biológicos* (Law that establishes the Protection of the Collective Knowledge of Indigenous Peoples linked to Biological Resources)	indigenous right to protect that knowledge.
	Ley No. 24656, Ley General de Comunidades Campesinas (General Law concerning Rural Populations)	Overarching law recognizing the right of rural populations to exist and conduct their affairs as democratic institutions.
	Ley No. 29785, Ley del Derecho a la Consulta Previa a los Pueblos Indígenas u Originarios reconocido en el Convenio (Law of the Right to Prior Consultation for Indigenous and Originating Communities as recognized in the Convention) Associated regulation: *D.S. 001-2012-MC*	Law recognizing that indigenous groups have the right to have prior consultation before legislative or administrative action is taken on matters that concern them directly.
	Ley No. 28736, Ley para la protección de Pueblos Indigenas u Originarios en situación de aislamiento y en situación de contacto inicial (Law for the protection of Indigenous and Originating Communities that are isolated and during initial contact) Associated regulation: *D.S. 008-2007-MIMDES*	Law that protects isolated indigenous groups during initial contact. Outlines the procedures that need to be followed during such interactions.
	Ley No. 26505, Ley de la Inversión privada en el desarrollo de las actividades económicas en las tierras del territorio nacional y de las comunidades campesinas y nativas (Law on private investment in the development of economic activities on national land and native and community land) Associated regulation: *D.S. 011-97-AG, D.S. 017-96-AG*	Law and associated regulation to protect land owned by rural communities and indigenous groups and the associated economic activities involved therein during the private investment and development process.
Cultural Heritage Aspects	*Ley No. 28296, Ley General del Patrimonio Cultural de la Nación* (General Law concerning the Cultural Patrimony of the Nation)	Conservation of historical and archaeological remains.

Topic	Key Regulation	Brief Description
	Peru	
	Associated regulation: *D.S. 011-2006-ED*	
	Decreto Supremo No. 003-2014-MC, Reglamento de Intervenciones Arqueológicas (Regulation for Archaeological Interventions)	Regulation regarding archaeological monitoring during projects in order to preserve the cultural patrimony of the State
	Decreto Legislativo No. 1079, Decreto Legislativo que establece medidas que garanticen el patrimonio de las áreas naturales protegidas (Legislative Decree that establishes measures to guarantee that cultural heritage is protected in protected natural areas) Associated regulation: *D.S. 008-2008-MINAM*	Legislates measures to protect cultural resources within natural protected areas.
Sustainable Finance	*Resolución SBS No. 1928-2015, Reglamento para la Gestión del Riesgo Social y Ambiental* (Regulation for Social and Environmental Risk Management)	Regulation that establishes minimum requirements for social and environmental risk management while also promoting the implementation of best practices in order to minimize risk for businesses in the financial sector.

Topic	Key EHS Regulation	Brief Description
	China	
	Environment	
General	Environmental Protection Law (2014)	Regulation on the general principles and requirements for the protection of environmental within the China territory. This law sets the basic requirements of environmental "3 synchronies" permitting and project management and guides the promulgation of specific air, water, solid waste, noise, ecological laws and regulations, as well as the general monitoring, reporting and recordkeeping requirements.
	Soil and Water Conservation Law (2010)	Law sets the general requirements and procedures for a project to trigger and complete a soil and water conservation plan, as well as the subsequent implementation of soil and water conservation measures.
	Land Management Law (2004)	Legislation serves to ensure strict land administration; rational land use; protection of cultivated land; and reasonable land acquisition compensation and resettlement.
	Guidance on Environmental Protection for Outbound Investment and Cooperation (2013)	This Guidance is jointly issued by the Ministry of Commerce and Ministry of Environmental Protection, and is designed to guide

Topic	*Key EHS Regulation*	*Brief Description*
China		
		Chinese outbound investors and contractors on supporting the local countries' sustainable development. The Guidance generally requires that investors and contractors comply with local laws and regulations on EHS and social matters, and encourages investors and contractors undertake due diligence in merge and acquisition activities. *http://fec.mofcom.gov.cn/article/zcfg/201302/1735624_1.html*
Occupational Health and Safety		
General	Work Safety Law (2014)	Law sets the general principles and procedures for the safety "3 synchronies" permitting and management. It also contains detailed requirements of project/company safety management system, capacity building, training, inspection, monitoring and recordkeeping
	Occupational Disease Prevention and Control Law (2012)	Law sets the general principles and requirements for the occupational health "3 synchronies" permitting and management. It also contains requirements of continuous occupational health medical surveillance and treatment, as well as project/company occupational health management system requirements.
	Firefighting Law (2008)	Law on the general principles and procedures for the firefighting facilities/installations "3 synchronies" permitting and project management. It also contains requirements on the operation and maintenance of firefighting equipment, inspection, emergency response provisions, etc.
Community Health and Safety		
General	Guide on Social Responsibility for Chinese International Contractors	Establishes a benchmark of social responsibility for the industry and encourages enterprises to uphold their global responsibility and to operate overseas contracting projects in more responsible ways based on the practices of the Association's members. The Guidance reflects international practices on social responsibilities as embedded in the United Nations Global Compact and the ISO 26000 Guidance on Social Responsibility; and summarizes and incorporates recent industry best practices; and enshrines the common understanding of the Chinese international contracting industry towards social responsibility. *http://images.12312.gov.cn/201209/20120928163135930.pdf*
Other Relevant Laws and Guidelines[v]		

[v] Note that the list in this subsection is not comprehensive and only lists the primary laws and legislation.

Topic	*Key EHS Regulation*	*Brief Description*
	China	
ESIA Process	Environmental Impact Assessment Law (2004)	Regulation on the implementation of the project environmental impact assessment process. It sets out the general procedures for completing environmental impact assessments for various projects.
Cultural Heritage Aspects	Cultural Heritage Protection Law (2015)	Law on the protection and conservation of cultural heritage and cultural relics.
Corporate social Responsibility	Guidelines to the State-owned Enterprises Directly under the Central Government on Fulfilling Corporate Social Responsibilities (2008): State-Owned Assets Supervision and Administration Commission of the State Council (SASAC)	Include responsibilities for legal and honest business operation, sustainable profits, innovation, resource conservation and environmental protection, duties toward employees' well-being and development, community engagement and reporting on implementation
	Guidelines for Social Responsibility in Chinese Outbound Mining Investments (2014) China Chamber of Commerce for Minerals, Metals and Chemicals Importers and Exporters (CCCMC)	Non-compulsory guidelines for investors in mining industry relevant to social performances of operations, including community relations, public health and safety, local content, etc..

- The Table is not and exhaustive and comprehensive list of legal framework and regulations. It is intended to be a guideline and a roadmap of key legislation in each of these countries.

Appendix C

References and Resources for EHS International Good Practice

Table C-1 Key International EHS References and Resources

Reference /Resource	*Author and Date*	*Website*
General Environmental, Health and Safety		
Global Compact Network China	Global Compact 2014	Eng: http://www.gcchina.org.cn/english CN: http://www.gcchina.org.cn/
Sustainable Development Framework Assurance Procedure - International Council of Mining and Metals	International Council of Mining and Metals	Community Development Toolkit http://www.icmm.com/document/145 Grievance Mechanism http://www.icmm.com/document/929 Mining: Partnerships for Development Toolkit Introduction http://www.icmm.com/document/4552
Environmental and Social Policy	European Bank for Reconstruction and Development (EBRD) 2014	http://www.ebrd.com/news/publications/policies/environmental-and-social-policy-esp.html
Sub-Sectoral Environmental and Social Guidelines: Agricultural Production—Crops	EBRD 2010	http://www.ebrd.com/who-we-are/our-values/environmental-and-social-policy/tools-for-financial-intermediaries/agriculture.html
Sub-Sectoral Environmental and Social Guidelines: Building and Construction Activities	EBRD 2010	http://www.ebrd.com/who-we-are/our-values/environmental-and-social-policy/tools-for-financial-intermediaries/construction.html
Sub-Sectoral Environmental and Social Guidelines: Mining Open Cast	EBRD 2010	http://www.ebrd.com/who-we-are/our-values/environmental-and-social-policy/tools-for-financial-intermediaries/mining.html
Sub-Sectoral Environmental and Social Guidelines: Petroleum and Coal Products	EBRD 2010	http://www.ebrd.com/who-we-are/our-values/environmental-and-social-policy/tools-for-financial-intermediaries/mining.html
Sub-Sectoral Environmental and Social Guidelines: Pipelines	EBRD 2010	http://www.ebrd.com/who-we-are/our-values/environmental-and-social-policy/tools-for-financial-intermediaries/construction.html
Environment	Inter-	http://idbdocs.iadb.org/wsdocs/getdocument.as

and Safeguards Compliance Policy	American Development Bank (IDB) 2007	px?docnum=665902
Good Practice Guidance for Mining and Biodiversity	International Council on Mining and Metals (ICMM) 2006	http://www.icmm.com/page/1182/good-practice-guidance-for-mining-and-biodiversity
A Practical Guide to Catchment-based Water Management for the Mining and Metals Industry	ICMM 2015	http://www.icmm.com/publications/water-management-guide
A Cross-Sector Guide for Implementing the Mitigation Hierarchy	ICMM 2015	http://www.icmm.com/document/9460
Conditions of Contract for EPC Turnkey Projects.	International Federation of Consulting Engineers 1999	http://fidic.org/books/epcturnkey-contract-1st-ed-1999-silver-book
Environmental and Social Management System Implementation Handbook: Construction	International Finance Corporation (IFC) 2014	http://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/ifc+sustainability/learning+and+adapting/knowledge+products/publications/esms_implementation_handbook-construction
IFC Performance Standards on Environmental and Social Sustainability and Guidance Notes	IFC 2012	**Eng.** http://www.ifc.org/wps/wcm/connect/e280ef804a0256609709ffd1a5d13d27/GN_English_2012_Full- Document.pdf?MOD=AJPERES **CN** http://www.ifc.org/wps/wcm/connect/1e1241004f5ae17a9049de032730e94e/GN_Chinese_2012_Full- Document.pdf?MOD=AJPERES **Eng.** http://www.ifc.org/wps/wcm/connect/115482804a0255db96fbffd1a5d13d27/PS_English_2012_Full- Document.pdf?MOD=AJPERES **CN** http://www.ifc.org/wps/wcm/connect/5fd142004a585f48ba3ebf8969adcc27/PS_Chinese_2012_Full- Document.pdf?MOD=AJPERES
General EHS Guidelines	IFC 2007	**Eng.** http://www.ifc.org/wps/wcm/connect/554e8d80488658e4b76af76a6515bb18/Final%2B-%2BGeneral%2BEHS%2BGuidelines.pdf?MOD=AJPERES

		CN http://www.ifc.org/wps/wcm/connect/034e3d80488658cdb712f76a6515bb18/001%2BGeneral%2BEHS%2BGuidelines.pdf?MOD=AJPERES&CACHEID=034e3d80488658cdb712f76a6515bb18
EHS Guidelines for Annual Crop Production	IFC 2007	http://www.ifc.org/wps/wcm/connect/077b7f004885533bae2cfe6a6515bb18/Final+-+Annual+Crop+Production.pdf?MOD=AJPERES
EHS Guidelines for Mining	IFC 2007	http://www.ifc.org/wps/wcm/connect/1f4dc28048855af4879cd76a6515bb18/Final%2B-%2BMining.pdf?MOD=AJPERES&id=1323153264157
EHS Guidelines for Liquefied Natural Gas (LNG) Facilities	IFC 2007	http://www.gcgf.org/wps/wcm/connect/87e7a48048855295ac04fe6a6515bb18/Final%2B-%2BLNG.pdf?MOD=AJPERES&id=1323161924903
EHS Guidelines for Offshore Oil and Gas Development	IFC 2015	http://www.ifc.org/wps/wcm/connect/f3a7f38048cb251ea609b76bcf395ce1/FINAL_Jun+2015_Offshore+Oil+and+Gas_EHS+Guideline.pdf?MOD=AJPERES
EHS Guidelines for Onshore Oil and Gas Development	IFC 2007	http://www.ifc.org/wps/wcm/connect/4504dd0048855253ab44fb6a6515bb18/Final%2B-%2BOnshore%2BOil%2Band%2BGas%2BDevelopment.pdf?MOD=AJPERES&id=1323153172270
EHS Guidelines for Plantation Crop Production	IFC 2007	http://www.ifc.org/wps/wcm/connect/78335e8048855bb989d4db6a6515bb18/Final+-+Plantation+Crop+Production.pdf?MOD=AJPERES
EHS Guidelines for Ports, Harbors and Terminals	IFC 2007	http://www.ifc.org/wps/wcm/connect/9e558c00488556ebbaf4fa6a6515bb18/Final%2B-%2BPorts%252C%2BHarbors%2Band%2BTerminals.pdf?MOD=AJPERES&id=1323152828015
EHS Guidelines for Toll Roads	IFC 2007	http://www.ifc.org/wps/wcm/connect/7e4c7f80488554d5b45cf66a6515bb18/Final%2B-%2BToll%2BRoads.pdf?MOD=AJPERES&id=1323162564158
ISO 14001: Environmental Management	International Organization for Standardization (ISO) 2015	http://www.iso.org/iso/home/standards/management-standards/iso14000.htm
ISO 26000: Guidance on Social Responsibility	ISO 2010	http://www.iso.org/iso/catalogue_detail?csnumber=42546
OECD Guidelines for Multinational Enterprises	Organization for Economic Co-operation and Development (OECD)	**Eng.** http://www.oecd.org/daf/inv/mne/48004323.pdf **CN:** http://mneguidelines.oecd.org/text/MNEGuidelines-Chinese.pdf

	2011	
E3Plus: A Framework for Responsible Exploration, Principles and Guidance Notes	Prospectors and Developers Association of Canada (PDAC) 2014	http://www.pdac.ca/docs/default-source/e3-plus---common/home-principles-and-guidance---full-document.pdf?sfvrsn=8
International Hydropower Association	International Hydropower Association (IHA) 2014	https://www.hydropower.org/
Hydropower Sustainability Assessment Protocol	IHA 2010	http://www.hydrosustainability.org/Protocol.aspx
Hydropower Sustainability Assessment Protocol – Chinese Translation	IHA 2010	http://www.hydrosustainability.org/getattachment/26dbba9c-5249-4183-9f23-28a17eb67250/Chinese-Translation-of-the-Protocol.aspx
World Commission on Dams	World Commission on Dams 2015	www.dams.org/
Improving social and environmental performance	International Petroleum Industry Environmental Conservation Association (IPIECA) 2015	http://www.ipieca.org/publication/improving-social-and-environmental-performance-good-practice-guidance-oil-and-gas-indus-0
Publications on sustainability, social impact, water, climate and energy, etc.	World Business Council for Sustainable Development (WBCSD)	http://wbcsdpublications.org/
Guidelines on Environmental Protection in Foreign Investment and Cooperation (2013): Chinese Ministry of Commerce (MOFCOM) and the	Chinese Ministry of Commerce (MOFCOM) and the Ministry of Environmental Protection (MEP) 2013	**Eng.** http://english.mofcom.gov.cn/article/policyrelease/bbb/201303/20130300043226.shtml **Cn:** http://www.mofcom.gov.cn/article/b/bf/201302/20130200039930.shtml

Ministry of Environmental Protection (MEP)		
Specific References for Occupational Health and Safety		
A10.32 Construction Sites	American National Standards Institute (ANSI) 2012	http://webstore.ansi.org/safety_standards/default.aspx?source=ohs#3
2359 Fall Protection Standard	ANSI 2007	http://webstore.ansi.org/safety_standards/default.aspx?source=ohs#2
Electronic Library of Construction Occupational Safety & Health materials, Struck-by Hazards	Center for Construction Research and Training (CCRT)	http://www.elcosh.org/en/browse/71/struck-by.html
Directive 89/686/EEC	European Agency for Safety and Health at Work (EASHW) 1989	https://osha.europa.eu/en/legislation/directives/34
Good Practice Guidance on Occupational Health Risk Assessment	ICMM 2007	https://www.icmm.com/document/629
The Setting and Use of Occupational Exposure Limits: Current practice	ICMM 2007	http://www.icmm.com/document/17
Health and safety critical control management: good practice guide	ICMM 2015	http://www.icmm.com/document/8570
Guidelines on Occupational Safety & Health Management Systems	International Labor Organization (ILO) 2001	http://www.ilo.org/public/english/protection/safework/cops/english/download/e000013.pdf
ISO 45001: Occupational Health and Safety	ISO 2015	http://www.iso.org/iso/home/standards/management-standards/iso45001.htm

Publication 98-142 Preventing Worker Injuries and Deaths from Traffic-Related Motor Vehicle Crashes	National Institute for Occupational Safety and Health (NIOSH) 1998	http://www.cdc.gov/niosh/docs/98-142/pdfs/98-142sum.pdf
Safety and Health Topic: Construction Safety	NIOSH 2011	http://www.cdc.gov/niosh/topics/constructionsafety/
Code of Federal Regulations Title 29 Part 1910 Occupational Safety and Health Standards	Occupational Health and Safety Administration, US Department of Labor	https://www.osha.gov/pls/oshaweb/owasrch.search_form?p_doc_type=STANDARDS&p_toc_level=1&p_keyvalue=1926
Code of Federal Regulations Title 29 Part 1926 Safety and Health Regulations for Construction	OSHA 2014	https://www.osha.gov/pls/oshaweb/owasrch.search_form?p_doc_type=STANDARDS&p_toc_level=1&p_keyvalue=1910
Highway Work Zones and Signs, Signals, and Barricades Topic Page	OSHA 2015	http://www.osha.gov/doc/highway_workzones/index.html
Prevention of Major Industrial Accidents	ILO 1991	http://www.ilo.org/wcmsp5/groups/public/---ed_protect/---protrav/---safework/documents/normativeinstrument/wcms_107829.pdf
Specific References for Community Health and Safety		
Community Health Programs in the Mining and Metals Industry (Report)	ICMM 2013	http://www.icmm.com/document/5788
Stakeholder Research Toolkit	ICMM 2015	http://www.icmm.com/document/8516
Workers' Accommodation: Processes and Standards	IFC and EBRD 2009	http://www.ebrd.com/downloads/about/sustainability/Workers_accomodation.pdf

Social Accountability 8000	Social Accountability International (SAI) 2015	http://sa-intl.org/_data/n_0001/resources/live/SA8000%20Standard%202014.pdf
Specific References for Specific Environmental Issues		
Roundtable for Responsible Soy	RTRS 2015	http://www.responsiblesoy.org/?lang=en
Roundtable on Sustainable Palm Oil	RSPO 2015	http://www.rspo.org/
Global G.A.P.	Global Good Agricultural Practice (GAP) 2015	http://www.globalgap.org/uk_en/
Better Cotton Standard System	Better Cotton Initiative (BCI) 2015	http://bettercotton.org/about-better-cotton/better-cotton-standard-system/
Forest Stewardship Council	Forest Stewardship Council (FSC) 2015	https://ic.fsc.org/
GRI Standards	Global Reporting Initiative (GRI) 2014	https://www.globalreporting.org/standards/Pages/default.aspx
Certificação Florestal (Forest Certification (CERFLOR)	Insituto Nacional de Metrologia, Qualidad e Tecnologia	http://www.inmetro.gov.br/qualidade/cerflor.asp
Specific References for Finance		
Equator Principles III	Equator Principles 2013	http://www.equator-principles.com/index.php/ep3
Asian Development Bank	ADB 2015	http://www.adb.org/
United Nations Environment Programme Finance Initiative	UNEP FI 2015	http://www.unepfi.org/
The Six Principles for Responsible Investment	Principles for Responsible Investment (PRI) 2015	http://www.unpri.org/about-pri/the-six-principles/

Notice on Issuing the Green Credit Guidelines China Banking Regulatory Commission (CBRC)	China Banking Regulatory Committee	**Eng.** http://www.cbrc.gov.cn/EngdocView.do?docID=3CE646AB629B46B9B533B1D8D9FF8C4A **Cn:** http://www.cbrc.gov.cn/chinese/home/docDOC_ReadView/127DE230BC31468B9329EFB01AF78BD4.html
Opinions of the CBRC Office on strengthening CSR of Financial Institutions (2007): China Banking Regulatory Commission (CBRC)	China Banking Regulatory Commission (CBRC) 2007	**Cn:** http://www.cbrc.gov.cn/govView_91D73B8D49484BF4B1D87D29F9577C2D.html
Supervisory Guidelines for Performance Appraisal of Banking Financial Institutions (2012): China Banking Regulatory Commissions	China Banking Regulatory Commission (CBRC) 2012	**Eng. And CN:**: http://www.lawinfochina.com/display.aspx?lib=law&id=11939&CGid=#
Strengthening Listed Companies' Assumption of Social Responsibility (Shanghai CSR Notice) and Guidelines on Listed Companies' Environmental Information Disclosure (Shanghai Environmental Disclosure Guidelines) (2008) Shanghai Stock Exchange	Shanghai Stock Exchange 2008	

Social Responsibility Instructions to Listed Companies (2006) Shenzhen Stock Exchange	Shenzhen Stock Exchange 2006	Eng: http://www.szse.cn/main/en/rulseandregulations/sserules/2007060410636.shtml Ch: http://www.szse.cn/main/disclosure/bsgg/200609259299.shtml
Corporate Social Responsibility		
Guidelines for Social Responsibility in Chinese Outbound Mining Investments (2014) China Chamber of Commerce for Minerals, Metals and Chemicals Importers and Exporters (CCCMC)	China Chamber of Commerce for Minerals, Metals and Chemicals Importers and Exporters (CCCMC) 2014	Eng and Ch: http://www.cccmc.org.cn/docs/2014-10/20141029161135692190.pdf
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