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Sub-sectoral Environmental and Social Guidelines: Pipelines

PROCESS DESCRIPTION

Pipelines are used for a range of transportation purposes such as water supply, sewage and wastewater removal, petroleum and petrochemical liquids, gas, minerals and sand slurry. They are also used as powerline and cable conduits. Pumps or compressors are used to transport liquids or gas from the supply to the delivery point. This guideline covers the construction, operation, maintenance and decommissioning of major pipelines.

Planning

Initial pipeline planning involves the identification of possible routes between the supply and delivery points. The selection is gradually refined and narrowed following consideration of a range of safety, commercial, engineering, social and environmental factors. Prior to its construction, an authorisation is normally required from the regional authority, for example, to ensure that it will not disrupt the local environment. A proposed pipeline, which crosses more than one jurisdiction, will require co-ordinated approvals. A detailed environmental impact assessment is normally required. Discussions should be held with regulatory authorities and interested parties in order to identify potential issues at an early stage.

Construction

Pipes may be buried in trenches, bored through rocky ground, drilled using horizontally directional drilling (typically under water bodies) or constructed above the ground surface.

Pipelines are constructed in a sequential process, including staking of the right-of-way (ROW) and pipeline centreline; ROW clearing and grading;

trenching (for buried pipeline); pipe laying, welding, and bending; field coating of welded joints; testing; lowering; trench backfilling; and ROW reinstatement.

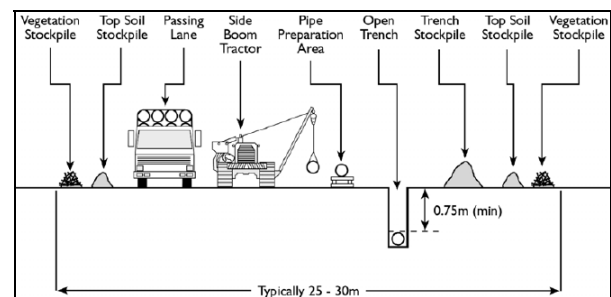


Figure 1: Small Diameter Pipeline Construction (APIA 2009)

Use

During commissioning, flow lines, pipelines, and associated facilities are filled with water and hydro-tested to ensure integrity.

Once built, the pipeline requires careful management and maintenance to reduce the risk of leaks. Pipeline operation usually requires frequent inspections and periodic ROW and facility maintenance. Production and pipeline operation is usually monitored and controlled from a central location through a supervisory control and data acquisition system (SCADA) which allows field operating variables to be monitored such as flow rate, pressure, and temperature and to open and close valves.

Decommissioning

When no longer required the pipelines are decommissioned. Decommissioning requires careful assessment and balancing of environmental issues and close communication with regulators and other stakeholders to consider health and safety, environmental



impacts, technical options and costs. There are three main options:

- Suspension – the pipelines are isolated from the system. They may be purged with inert material and they are blinded at the ends. The pipelines are maintained as per an operating system in accordance with required standards
- Abandonment in Place – Pipelines are physically disconnected, purged, cleaned and capped at the ends. The pipelines are depressurised and not maintained. They are left to corrode and biodegrade in situ. All above ground structures are removed and the ROW is rehabilitated.
- Removal – As above but all below ground structures are also removed. Removal is not normally the best practice for buried pipelines.

Construction and decommissioning operations may be associated with workers camps and laydown areas.

KEY ENVIRONMENTAL, HEALTH AND SAFETY RISK/LIABILITY ISSUES

Land Use & Biodiversity

The land area required for the pipeline route, stockpiles, waste materials and other surface infrastructure such as buildings, access roads and construction camps could destroy features of economic, cultural and natural conservation value.

Clearing of the pipeline construction area involves the removal of trees, shrubs, stumps and other obstacles to provide access. This not only affects the immediate environment but also

wildlife that may migrate through the area and are impacted as a result of habitat fragmentation.

Consultation with key stakeholders will be required to understand any conflicting land use requirements, the communities' dependency on natural resources and any conservation requirements.

Disturbance to native vegetation and wildlife habitat must be avoided or minimised through careful route selection and the application of appropriate management procedures.

Habitat alteration should be minimised to the extent feasible and critical habitats must be protected and preserved. The implementation of a Biodiversity Action Plan and biodiversity offset projects may be required by the regulatory authorities or funding agencies.

The regulatory authorities control the construction of pipelines through planning processes and authorisations which are granted prior to any development. If the intended work is not acceptable, the authorities may require the company to alter the original plans to reduce its potential impact. This may include diverting the pipeline from sensitive habitats and rerouting sections of the pipeline underground or above ground to minimise disruption of flora and fauna.

Where practicable, operations and maintenance activities should be scheduled during periods appropriate to land use activities as agreed with landowners in order to reduce potential adverse impacts.

Exploitation of Remote Areas

For all major pipelines, access is required for maintenance and construction purposes. In the



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case of long distance pipelines this access enters remote areas where there may be an abundance of protected species, habitats and indigenous populations. Measures should be taken to minimise exploitation and destruction of these resources and associated secondary impacts. Where possible, access to the pipeline should be via existing tracks. Public access should not be permitted unless an existing right of access exists.

Soil Management

Trench widths and depths should be minimised to reduce spoil generation where possible. The length of time a trench is open should be minimised and backfill should commence immediately following pipe laying.

In addition to soil removed during trenching, topsoil and in some cases sub-soil may need to be removed from the pipeline construction area, work and campsites to protect the soil from degradation due to traffic. This is known as grading. The length of time between vegetation clearance and grading, and between grading and reinstatement should be minimised to prevent soil erosion. Graded soil must be separately stockpiled from other materials and be readily recoverable for reinstatement.

Disturbance of water bodies might occur as a result of sedimentation from water runoff from the pipeline construction site. Slope stability, must be undertaken and drains and sediment barriers must be installed as necessary and maintained until final reinstatement is completed.

Maintaining an adequate level of vegetation cover over a buried pipeline is vital to protecting the soil as it reduces the volume and speed of surface water run-off and mitigates sediment

pollution to downstream slopes and waterways. Inadequate compaction of backfill can lead to subsidence.

Wastewater

Wastewater will arise from run-off from the site, stockpiles and from dewatering of the trench, prior to pipelaying. This water may be high in silt and may also be contaminated. It should be prevented from entering surface water bodies without prior assessment and treatment if necessary. Permission to discharge will be required from the landowner and relevant regulatory authority.

Measures to reduce run-off such as covering stockpiles may be required.

Water contaminated with cement is highly alkaline and can cause severe pollution. The placing of concrete in, or near to, any watercourse must be controlled to minimise the risk of pollution. Effluent from washing out of any concrete mixing plant must not be allowed to flow to any drain or watercourse.

Pipeline testing and commissioning must be carried out using water or other suitable non-toxic medium to detect possible leaks and weaknesses.

Spill Prevention and Response

There is a significant risk that a pipeline will leak during its lifetime as a result of corrosion, equipment failure, accidents, human error and as a result of third party interference. Depending on the nature of the material being transported and the area in which a spillage occurs, soil and groundwater contamination may take place. The risk of a release from a pipeline can be reduced through engineering design, monitoring of flow,



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scheduled maintenance and inspections and follow up action on incidents and identified problem areas. Spill Prevention and Response Plans should be prepared for all pipelines where the impact of spills may be detrimental to public safety of the environment.

The risk of pollution due to corrosion should be minimised with the use of internal and external corrosion mitigation measures such as use of corrosion resistant materials, coatings or linings, chemical additives, cathodic protection and regular monitoring and physical inspection of the pipeline.

Fuel & Chemical Storage

Fixed oil storage facilities must be located on an impervious base within oil tight secondary containment. Mobile bowsers must be located to avoid the risk of spillages entering a watercourse or groundwater. Bowsers should be secured to prevent unauthorised access and stored within a security compound when not in use.

Significant hazardous properties relating to individual chemicals include flammability, combustion potential, toxicity, corrosive potential and oxidising potential. Chemicals with such properties should be labelled with the appropriate internationally recognised diamond shaped hazard symbol¹. Inadequate control of hazardous chemicals can elevate the risk of a major accident harming workers, the local community and the environment.

Some chemicals may only possess a hazard potential if they have the opportunity to react with other compounds. Chemicals with

different hazard symbols should not be stored together - clear guidance on the compatibility of different chemicals can be obtained from the Materials Safety Data Sheet (MSDS) which should be readily available from the manufacturer and on site.

Accidental release of hazardous chemicals on site and in transit may result in explosions, air pollution and significant environmental impacts in relation to soil, groundwater and surface water contamination. Releases of hazardous substances to the air could impact the local environment including human receptors.

Collision

Collision can occur on construction sites as a result of moving equipment and vehicles. Proper site planning and layout are required as a lack of designated vehicle and pedestrian paths can result in collision.

Confined Spaces

Excavations on construction sites can present a risk to workers where construction is incomplete or access is unrestricted. One of the greatest risks is cave-ins or falls from height.

Slips, Trips and Falls

Many people work at height on construction sites and falls from height are common. Working with trenches and unstable ground and uneven surfaces can result in injury or harm. Poor site layout and housekeeping on a construction site can result in slips, trips and falls.

¹ United Nations 2007



Site Security

Sites can often be subject to trespass, vandalism or theft. This can result in an increase in environment, health and safety risks. Each site should be properly secured to prevent unauthorised access.

Dust and Air Emissions

Pipeline construction may create large amounts of dust through:

- Blasting;
- Excavation;
- Moving equipment;
- Traffic on unsealed roadways;
- Loading and unloading operations;
- Stockpile stacking;
- Land reclamation operations;

this can be hazardous to health when inhaled or can cause a nuisance to communities. Dust can be controlled by regular watering with mobile water trucks or fixed sprinkler systems. Otherwise, where water is limited or water minimisation is required, surface binding agents, the sealing of heavily used access ways and the covering of stockpiles should be implemented.

Buried Services

The presence of the pipeline must be clearly marked to prevent accidental damage to the pipeline and injury to third parties during future excavations or above ground works.

OTHER POTENTIAL ENVIRONMENTAL, HEALTH AND SAFETY RISKS/LIABILITIES

Energy Consumption

If the pipeline is located in an area where the ground freezes it is possible that it will require heating to ensure flow of material within the pipe. This will entail energy use as a heating fuel and for pumping/compressing. As a result of this heating it is possible that perma frost will melt.

Fugitive Emissions

Fugitive emissions can be released from leaking pipes and tubing/pump seals. To minimise or avoid release ensure installations are well maintained and selection of appropriate valves, fittings and flanges.

Hydrology

Sub-surface water flow can be affected by the presence of the pipeline, leading to the risk of flooding. Flow and erosion along the new pipeline should be prevented using means such as trench blocks and compaction of backfilled soils. Flow across the pipeline must be permitted by the installation of permeable zones within the backfill or other forms of subsoil drainage.

Solid Waste

During construction, excavation will take place and waste soils might occur which need to be disposed of. Other solid wastes created during construction will be waste construction materials and pipework.



Visual Impact

During construction significant visual impact can take place. Once constructed, an aboveground pipeline may be a significant visual impact to the surrounding area. This can be reduced through careful planning of the pipeline route and positioning above or below ground and the use of screening methods.

Pest and Disease Control

Construction activities may provide conditions for the spread of diseases between properties or areas via the disturbance of soil or the transportation of contaminated plant or equipment from one site to the next.

Contaminated Land

Land that is being developed could be contaminated which can result in the need for disposal of contaminated soils. In addition, there could be health and safety risks for workers.

Noise and Vibration

Moving equipment, generators and machinery will create noise and vibration on construction sites which can lead to long term occupational health and safety problems for construction site workers.

Manual Handling

Construction activities can result in lifting of heavy or awkward shaped objects which can result in various injuries.

Exposure to Extremes in Temperature

Workers are typically outside on a construction site and are susceptible to variations in temperature, either heat and the sun or cold.

Remote Site Health

Construction operations may be located in extremely remote areas with little or no access to emergency or general medical services. A programme of illness prevention through education, sanitation measures and vector² control should be adopted.

KEY SOCIAL, LABOUR AND COMMUNITY RISKS/LIABILITY ISSUES

Human Rights, Local Communities & Indigenous Peoples

Rural communities and indigenous peoples often lack legal title to their lands, even though they may have occupied the same lands for many generations. Consequently, they may be vulnerable to eviction when a pipeline route is approved, and the eviction may be imposed without prior consultation, meaningful compensation, or the offer of equivalent lands elsewhere. These are human rights violations and are not acceptable practice. Those that remain may experience a loss of revenue due to the environmental damage to the resources on which they rely for agriculture, such as water or loss of traditional livelihoods.

² A vector is an organism that does not cause disease itself but serves as a transmission route conveying pathogens from one host to another



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Where resettlement takes place, companies need to ensure that living standards are not diminished, that community and social ties are preserved, and that they provide fair compensation for loss of assets and economic opportunity among others. Roles and responsibilities for ensuring the long-term well-being of resettled communities need to be defined and monitored. Meaningful community participation in projects is required through consultation to obtain "free, prior, informed consent" for all operations which may impact communities.

Governance

With good governance the exploitation of mineral resources can generate large revenues to foster growth and reduce poverty. However, when governance is weak, it may result in poverty, corruption, and conflict. The Extractive Industries Transparency Initiative (EITI) aims to strengthen governance by improving transparency and accountability in the extractives sector. The EITI sets a global standard for companies to publish what they pay and for governments to disclose what they receive.

Community Health & Welfare

The construction of a pipeline leads to a temporary influx of migrant workers and their family members and service workers. Unless carefully managed, through proactive and sustained intervention, this frequently leads to an increase in the transmission of communicable diseases such as sexually transmitted infections including HIV and respiratory diseases which may transfer to local communities. It may also lead to increased alcoholism, prostitution, drug use, and other crime.

Migrant Workers & Contractor Management

Pipeline construction typically attracts a large number of casual/short term workers, many of whom may be internal or foreign migrant workers. They may be hired directly or more usually by labour agents or sub-contractors. These factors make these workers more vulnerable to discriminatory treatment and/or exploitation. There must be binding legal requirements on these sub-contractors to adhere to the company's commitments on the environment, health, safety, social issues and overall management.

Worker Accommodation

If temporary accommodation is provided it shall be appropriate for its location and must be clean, safe and, at a minimum, meet the basic needs of workers. It should comply with all national legislation and meet international good practice standards. Workers freedom of movement to and from the employer-provided accommodation shall not be unduly restricted.

Cultural Heritage

Significant sites of cultural heritage may have been identified during the impact assessment stage and the route selection managed to avoid or minimise the impact. The latter may require fencing or flagging of the features to be avoided. Cultural training for construction personnel may be required to increase knowledge, awareness and respect of the artefacts and sites.

During construction, there is a potential for activities such as earthmoving to uncover previously unrecorded heritage sites. Procedures should be agreed in advance by all relevant stakeholders to cover this event. These should include;



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- A temporary halt in activities at the location;
- Notification of project management and appropriate specialists to assess significance;
- Notification of regulatory authorities and community representatives;
- Identification of appropriate management options in consultation with all stakeholders.

Transport and Access

- Movement of materials to and from the site might lead to road noise and traffic congestion, along with heavy vehicles using rural roads.
- Construction of the pipeline and access roads may cause short-term disruption to land-owners and users in terms of access.
- New access roads may enable third party access to areas previously inaccessible.

OTHER SOCIAL, LABOUR AND COMMUNITY RISKS/LIABILITY ISSUES

Financial Dependency

Major pipeline constructions may provide support infrastructure for workers. In remote locations, settlements may develop or become dependent upon the income from these workers. Such communities can become unstable both politically and financially once the construction work moves on.

Noise

Construction activities will generally cause an increase in local noise levels but this will be short lived at any one location.

Dust

Public/environmental health and nuisance issues associated with dust and vented fumes can arise from construction activities and may have a significant effect on neighbouring locations. This may be important if there are neighbouring residential and industry in the area.

FINANCIAL IMPLICATIONS

- Compensation may possibly be required by regulatory authorities for loss of natural resources, for resettlement and economic displacements;
- Protest by local population and non-governmental organisations to defend existing surface features can lead to delays in the permitting process;
- Failure to gain co-ordinated approval from all jurisdictions crossed may cause delays.
- Costs may be incurred for the restoration of habitats that may have been destroyed during the construction or use of the pipeline;
- If cultural artefacts are found, delays can occur while excavation and investigation takes place.
- If land is required to be purchased to install the pipeline this will incur costs;
- Exposure of employees to occupational hazards may result in health compensation



claims and may lead to increased payroll costs to replace skilled workers and lost production time;

- Capital investment may be required to comply with new environmental, health and safety requirements;
- Fines, penalties and third party claims may be incurred for non-compliance with environment, health and safety regulations.

IMPROVEMENTS

Environmental, Health & Safety Improvements

- Control operations by having a permit to work system which covers environment, health, safety and operational areas;
- Ensure the findings from the EIAs and SIAs and any other agreements are appropriately incorporated in to the operational programme for the pipeline;
- Introduce environment, health and safety training for all employees and contractors;
- Plan the route of the pipeline to reduce the impact on the surrounding area;
- Consider use of animal crossing structures, such as, bridges, culverts and over crossings along pipeline and access road rights of way to mitigate impacts on migrating species;
- Bury pipelines along the entire length to a minimum of 1m to the top wherever possible;
- Undertake cable/service surveys prior to excavation work;
- Schedule periodic inspection and maintenance to avoid disturbance/disruption of sensitive habitats;
- Good housekeeping should be maintained at all times in all areas of the site;
- Prevent unauthorised or unintentional intrusion to protected areas through fencing or flagging;
- Control **dust** emissions and impacts by:
 - Use of dust suppression techniques on site roads and stockpiles, e.g. water sprinkling, speed controls, all-weather surfaces;
 - Dedicated parking areas for employee vehicles;
 - Use and maintain effective filters in vehicle cabs to keep air free of dusts and fumes;
- Reduce **noise and vibration** impacts by:
 - Ensuring equipment is maintained to manufacturers standards and that noise baffles are fitted.
 - Reducing exposure times for people working near noisy machinery;
 - Providing workers with appropriate hearing protection
 - Careful control of blasting to reduce noise and vibration, e.g. timing and proximity to receptors;
- Provide personnel training on explosives handling and safety management. Only



certified blasters or explosives experts should conduct blasts;

- **Prevent leaks** by

- Utilising engineering design to provide adequate protection from likely external physical forces, e.g. seismicity, floods, landslides, permafrost, vegetation;
- Installing positive pipe corrosion control measures, for example, coatings, cathodic protection, chemical additives, heaters;
- Ensuring that the SCADA is well maintained and used correctly to control flow and pressure.

- **Detect leaks** by installing leak detection equipment, e.g.

- Monitoring the flow in the pipe through pressure sensors connected to alarms and automatic pump shutdown systems;
- Continuous metering to provide a comparison between input and output for leak detection;

- **Emergency response.** Introduce accident, fire and explosion precautions and emergency response procedures;

- These should be tested and drills should occur regularly with appropriate reporting on response times etc.;

- **Storage of materials and pollution control.** Bulk containment (e.g. oil storage tanks) must be:

- Inspected regularly to prevent leakage;

- Provided with secondary spill containment;
- Installed with automatic alarms and shut off systems;
- Checked prior to delivery to prevent overfill and spillage;
- Properly contained for decanting and fill areas to contain any spillage during transfer.

- **Visual impact.** Reduce visual impact by techniques such as:

- minimising the area of grading;
- immediate backfill and reinstatement of affected areas;
- timing vegetation removal to occur close to actual works;

- Ensure **contaminated water** from dewatering or cement washing operations is treated prior to discharge, depending on the nature of the contaminants provide catchment lagoons in order to effect sediment control;

- Reduce **sediment loading** of waste water and run-off by:

- Reducing exposure time of soil and rock to wind or water, by covering exposed stockpiles and reducing length of time between vegetation clearance and grading, and between grading and reinstatement;
- Limiting the amount of pipeline trench left open during construction at any one time;



- Use of settling ponds, silt fences and screens to prevent sediment transport;
 - Provision of personal protective equipment (PPE) that is fit for the task to prevent injury and maintain hygiene standards. Workers should be trained in the correct selection, use and maintenance of PPE correct storage areas should be provided;
 - Redesign manual processes to avoid heavy lifting activities;
 - Install mechanical lifting aids where possible and rotate work tasks to reduce repetitive activities;
 - Separate people from vehicles and machinery where practicable:
 - Ensure drivers and users are properly trained to operate the machinery and equipment;
 - Fit vehicles with rollover protective structures;
 - Introduce site routing plans to reduce the likelihood of collision;
 - Ensure that machinery, such as, conveyors or crushers, is adequately guarded to reduce likelihood of entrapment.
- Social, Labour and Community Improvements***
- Minimise **access disruption** by:
 - Leaving gaps in pipelining operations to coincide with access routes;
 - Backfilling trenches as soon as pipe is laid;
 - Using existing access routes where possible;
 - Ensuring that new routes do not proliferate;
 - Ensuring worker vehicles are parked in designated areas to minimise any disruption to local communities;
 - Prevent **unauthorised access** to dedicated service roads to prevent exploitation of previously inaccessible areas;
 - **Consult** with key stakeholders (e.g. government, civil societies and potentially affected communities) at all stages of the planning, design, construction and decommissioning phases to:
 - Assess the potential for adverse impact due to in-migration;
 - Understand conflicting land use demands and community dependency on natural resources;
 - Obtain “free, prior and informed consent”;
 - Prepare an emergency response plan;
 - Prompt rehabilitation of disturbed areas that are most visible can reduce the visual impact and can improve relations with the local community;
 - Implement a **grievance/dispute resolution mechanism** for workers and members of the community to raise issues with the



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Company during planning, construction and use;

- **Worker and Community Health:**
 - Tailor pre-placement medical examinations to the requirements of the role;
 - Implement a drugs and alcohol policy for the operation;
 - Undertake health awareness and education programmes in collaboration with local community organisations;
 - Provide preventive treatment and vector control to site workers and families, e.g. immunisation; spraying, health monitoring. Consider extending to local community;
- Consider whether any upgrades to **site security** arrangements are required to prevent third party vandalism and theft.

GUIDE TO INITIAL DUE DILIGENCE SITE VISITS

During the initial site visit, the issues will vary according to the type of pipeline being installed and depending on the level of environment, health and safety management already introduced. It is unlikely to be possible to inspect all of the pipeline corridor due to its size. The success of the site visit also depends largely on the co-operation and availability of appropriate site personnel. However, emphasis must always be placed on the necessity to visually inspect areas considered important, such as, main compound, workers camps and at least a sample of actual works.

Valuable sources of information are the agreements with regulatory authorities with respect to approval of planning applications and discharge consents. The information on environmental controls is often contained in an 'Environmental Passport' document. Review of this information enables identification of the site-specific environmental issues.

General

- Confirm how the pipeline will be constructed and operated. Is it a joint venture between different organisations and which organisation has operational control? Also understand the type and number of contractors likely to be employed. Check that environment, health and safety systems will also apply to contractors;
- Confirm organisational responsibilities and systems for environment, health and safety;
- Look for signs of poor housekeeping such as signs of spillages and high numbers of empty drums. Particularly note any recent spills;
- Check the condition of any assets, facilities, equipment, production areas – look for wear and tear, and poor maintenance;
- Have there been any environment or health & safety accidents;
- Discuss emergency response to accidents and major incidents;
- Is fire fighting, first aid and spill response equipment available and are people competent in the use of the equipment and procedures and appropriately trained?



- Assess the level of health and safety awareness at the construction site, are staff wearing PPE appropriate for the task, e.g. safety boots, hard hat, high-visibility vests, gloves, ear-defenders, safety glasses etc. Review the health and safety statistics for the operation;
- Check signage and fencing around the site:
 - Is it adequate to ensure public and worker safety?
 - Are routes for pedestrians and vehicles segregated?
 - Are there designated parking areas?
- Is there any evidence of significant soil erosion, subsidence or compaction?
- Does vegetation in the pipeline corridor show signs of distress, e.g. dieback, stunted growth?
- Are aboveground pipes free from obvious external corrosion?

Access

- What is the condition of access routes? Are they sealed to prevent dust creation? Has access been by routes other than those designated? Have there been any complaints concerning access by landowners?
- Is access being maintained across the pipeline corridor for vehicles and livestock? Are crossings of railways and roads maintained to ensure the safety of the public (as required by the regulatory authorities)?

Security

- Are there any reports or evidence of unauthorised access by third parties to pipeline corridor or facilities?
- Are all facilities locked and secure?
- Have there been any disturbances between migrant workers and the local population?

Trenching

- Is water present in the trenches, is there any evidence of contamination of this water, and where is the water pumped to? Where is the water from the dewatering discharged to? Does it lead to wastewater treatment systems or discharge directly to surface waters? Note the colour and appearance of adjacent water courses;
- Is there evidence of immediate reinstatement works after pipelaying? What do the works comprise?
- Is the trench progressively backfilled with stockpiled soil?
- Is soil and waste rock stockpiled near surface watercourses or over areas of possible cultural or nature conservation value?
- Are the stockpiles surrounded by surface drains to collect sediment loaded surface run-off and so protect water courses? Do they appear to be heavily eroding and slumping?
- How are these organised?
- Does the area look well managed or are excessive areas of land used and contaminated?



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- Is surface runoff from the areas collected and where is it discharged?
- Does any discharge look as though it is heavily contaminated by solids? What colour is it?
- Are silt fences and screens in evidence?

Fuel and Bulk Material Storage Arrangements

- What fuels and materials are stored in bulk on site?
- To gauge the potential for spillages and leaks consider the following:
 - Are surface storage tanks and usage areas hard surfaced and appropriately contained? Are these in good condition or are cracks present? Are these regularly tested for leakages?
 - Is the size of the containment adequate for the volume of the materials stored?
 - Is the containment regularly cleaned out to avoid loss of capacity due to holding rainwater etc.?
 - Are mobile bowsers used? What procedures are followed to minimise the risk of spillage and theft?

Waste Management

- Check that solid waste storage and disposal (storage equipment) is in a good condition;
- Check that waste disposal takes place on a regular basis;

- Check that waste storage areas are clear of debris and that skips are covered to prevent waste escaping, for example, check that waste containers have lids or are stored in an area with a roof.

Sensitive Receptors

- Are there any human settlements (including indigenous populations), other economic activities (including forestry and agriculture), and wildlife habitats in the area which may be sensitive to the effects of the pipeline?;
- Note the proximity and sensitivity of aquatic environments;
- Note noise and vibration levels at the site and proximity to sensitive receptors such as schools, and housing;
- Have there been any complaints regarding dust or noise levels?
- Is there any visible disturbance to protected natural or cultural heritage sites? Are there any reports of personnel accessing prohibited areas?

Social, Labour and Community

- Have any communities been displaced by the development?
- Does the organisation engage in regular formal consultation with key interested parties including the local communities?
- Check that labour standards, contracting and remuneration are in line with national law and are consistent with the average for the sector;



- Check that hours worked, including overtime, are recorded and staff should receive written details of hours worked and payment received;
- Has the organisation received inspections from the local labour inspectorate in the previous three years? Have these resulted in any penalties, fines, major recommendations or corrective action plans?
- Does the organisation have a grievance mechanism that allows employees and other interested parties to raise concerns?
- Are employees free to form, or join, a worker's organisation of their choosing?
- Is there a programme of health awareness and education initiatives?

Other Useful Observations

Information should also be obtained on the following:

- Has the organisation or pipeline project been subject to any poor publicity?
- What systems are in place to check and maintain assets and infrastructure at the site?
- Check the conditions and duration of validity for all permits;
- Has the pipeline project been inspected recently (within the past 2 years) by the regulatory authorities for health, hygiene and environment? What were their findings?
- Have there been any recent (within the last three years) incidents concerning this or other pipeline projects run by the

organisation such as fatalities, fires/explosions, spills?

- Review budgets for capital expenditure (capex) and operational expenditure to cover environment, health and safety matters;
- Does the business plan have line items for Environment, Health and Safety and Hygiene improvements? Do financial provisions appropriately reflect operating and post closure environment, health and safety /social obligations as agreed with the authorities or other parties?

Take note/ask questions relating to any activities that address the improvements listed in the improvements section of this document.

Financials and Risk Management

- Does the organisation have insurance to cover any significant damage to the environment/community/operations (this may be covered by public liability insurance or the organisation may be party to an industry scheme). Review the terms of the cover;
- Does the business plan have line items for environment, health and safety improvements as well as asset management/maintenance?
- If the company plans to invest in new technology, what will be the impacts and benefits for human resources?
- Check the conditions and duration of validity for all permits. Is the company required to comply or implement any EHS improvement plans?



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ACTION PLANS

Dependent on the individual business, select appropriate improvements from the list above to include in the action plan. The plan should feature costed measures and set implementation targets. The measures may require increased management supervision, or significant process upgrades which may involve considerable capital expenditure.

As a minimum, any business should be required to have the following in place:

- Operational procedures to manage environmental, health and safety risks;
- Monitoring programmes;
- Improvement objectives, targets and project plans;
- Training for personnel;
- Regular independent inspections, checks and audits with records to demonstrate achievement of the required level of performance against legal requirements and improvement action;
- Emergency plans for environment, health and safety accidents;
- Senior management review/demonstrated involvement in environment, health, safety and hygiene management;
- Financial statement, budgets and financial projections which reflect environment, health, safety and social obligations.



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REFERENCES AND ADDITIONAL SOURCES

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