National Occupational Standards for Environmental Site Assessment Assistants

Final Validated Document

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BEAHR

Building Environmental Aboriginal Human Resources

Développement des ressources humaines autochtones en environnement

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JOB DEFINITION

An **Environmental Site Assessment Assistant (ESAA)** supports the qualified project team to undertake activities to logically assemble information to assess the presence or absence of potential environmental concerns as they relate to Environmental Site Assessment (ESA). The ESAA may assist with sampling and testing activities; interpretation and evaluation of data; and preparing reports.

The ESAA may act as a liaison between the community and the environmental professionals, and bring an understanding and respect for the importance of local or Traditional Knowledge as it encourages local participation, protects the environment, promotes the well-being of the community, promotes cultural sensitivity, e.g., understanding of cultural protocols, and places value on local history, e.g., archaeology, oral history.

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A. LOCAL KNOWLEDGE
A1. Obtain Local and Traditional Knowledge

A1.1 identify the importance of local and traditional knowledge

local knowledge enables an environmental assessment assistant to promote:

a) the well-being of the environment
b) the well-being of the community
c) safety while on the land
d) the wise use of resources
e) the value of the local knowledge and people
f) cultural sensitivity, e.g., understanding of cultural protocols
g) the value of local history, e.g., archaeology, oral history
h) local environmental capacity and community memory

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A1.2 identify knowledge about local land and water use

a) possess knowledge about historical land and water use, including:
   - location of:
     - travel and migration routes
     - traditional land and water-use sites, e.g., sacred sites, meeting sites, camp sites, lookouts
   - resource harvesting and gathering activities, e.g., berry picking, fishing, hunting , trapping, gathering materials for arts and crafts
   - cultural and common place names
   - traditional users of the area, e.g., Elders, Aboriginal families, groups
   - non-traditional users in the area, e.g., military, industry
b) possess knowledge about current land and water use, including:
   - resource harvesting and gathering activities, e.g., trapping
   - land classifications in the area, e.g., parks, sanctuaries, special conservation areas, commissioner's lands
   - location of:
     - transportation and utility corridors, e.g., pipelines, roads, hydro lines, seismic lines
     - travel and migration routes
   - current users of the area, e.g., industry, special interest groups, communities
c) future land and water use, e.g., community plans, government plans, industry plans

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A. LOCAL KNOWLEDGE
A1. Obtain Local and Traditional Knowledge

A1.3 identify knowledge about local terrain

a) identify types of land features, e.g., valleys, mountains, wetlands, pingos
b) identify characteristics of land features, for example:
   - composition, e.g., gravel, rock, topsoil, sand
   - behaviour, e.g., erosion, slides, slumping
   - permafrost, e.g., continuous or discontinuous
   - vegetation types, e.g., tundra, forested, bogs
c) identify types of water bodies, e.g., rivers, creeks, lakes, ground water
d) identify characteristics of water bodies, e.g., open water areas, currents, depths, direction of flow, water quality, overflow areas

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A1.4 identify knowledge about local vegetation

a) identify species present and/or vegetation zone
b) identify whether species are native or non-native
c) identify characteristics, for example:
   - edible or non-edible
   - bio-indicator use
d) identify abundance
e) identify seasonal patterns, e.g., budding, seed production, die off
f) identify physical attributes, e.g., erosion control, shelter, size, height, colour
g) identify forestry practices, e.g., clear-cut areas
h) identify medicinal or traditional uses
i) identify harvest management practices
j) identify listed species, e.g., endangered, at-risk
k) identify cultural significance

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A1.5 identify knowledge about local fish and wildlife

a) identify species present
b) identify whether species are native or non-native
c) identify population status
d) identify harvest management practices, e.g., seasons, quotas, methods
e) identify seasonal characteristics
f) identify bio-indicator status, for example:

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- size, age, sex and weight
- condition, e.g., health and appearance

g) identify stressors on local population, e.g., climate change, over-fishing
h) identify preferred and critical habitats, for example:
   - marshes and wetlands
   - nesting areas
   - calving grounds
i) identify behaviours, for example:
   - reproduction, e.g., mating, birthing, spawning
   - migration
j) identify life cycle times
k) identify traditional uses
l) identify cultural significance, including disposition of meat and fish
m) identify listed species

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A1.6 identify knowledge about local climate

a) identify seasonal patterns, e.g., freeze-up and break-up
b) identify temperatures ranges
c) identify amount of precipitation
d) identify signs of weather change, e.g., storm clouds, wind direction
e) identify unique characteristics, e.g., snow conditions, flooding patterns
f) identify evidence and impacts of short and long term climate change
g) identify wind and water erosion features, e.g., coastal degradation

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A. LOCAL KNOWLEDGE
A1. Obtain Local and Traditional Knowledge

A1.7 identify knowledge about the local political environment

a) identify structures of governance, including:
   - traditional
   - local/community
   - municipal/regional
   - provincial/territorial
   - federal
b) identify rights and agreements, for example:
   - Aboriginal rights
   - treaties and/or land claim agreements
   - socio-economic agreements
c) identify influential/knowledgeable community members, for example:
   - Elders
   - Chief and Council
   - trappers/harvesters
d) identify scope and jurisdiction of:
   - regulatory and advisory boards
   - councils
   - committees
   - government agencies
   - non-governmental agencies
e) identify historic and current relationships and collaborations

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A1.8 identify knowledge about local culture and community

a) identify community structures
b) identify community events
c) identify local cultural protocols and traditions, for example:
   - communication
   - gifting
   - introductions
d) identify local unique vocabulary for technical words

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A. LOCAL KNOWLEDGE
A1. Obtain Local and Traditional Knowledge

A1.9 obtain local knowledge

a) spend time on the land to gain first-hand local knowledge
b) participate in and respect community and traditional activities, e.g., ceremonies, celebrations, gatherings, harvesting, camping
c) speak with Elders, resource users, local people, landowners and other knowledgeable residents:
   - use the language of the Elder, if possible
   - identify local contacts
d) attend meetings, conferences and workshops
e) review maps
f) review local Traditional Knowledge database, if available
g) obtain information from special interest groups, individuals, relevant First Nations government departments and agencies, e.g., Department of Fisheries and Oceans (DFO), Department of Indian and Northern Affairs (DIAND), World Wildlife Fund (WWF)
h) take training courses
i) participate in focus groups
j) conduct research, e.g., use libraries and archives, search the Internet

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B. TECHNICAL KNOWLEDGE
B1. Describe Environmental Surveys and Testing

B1.1 describe environmental surveys

a) identify types of surveys, including:
   - biophysical survey is used to characterize and/or classify biophysical attributes, e.g., climate, vegetation, forestry, wildlife, fish
   - geological survey is used to characterize and/or classify geological attributes, e.g., geophysical, geochemical
   - air quality survey is used to characterize atmospheric conditions, e.g., pollution, dust levels
   - radiation survey is used to characterize levels of radiation, e.g., radon levels

b) describe purposes of surveys, for example:
   - providing baseline data, e.g., growing conditions
   - describing species and community relationships
   - monitoring mitigation efforts
   - documenting air quality conditions
   - conducting impact and site assessments
   - documenting rare species and habitats
   - determining biomass and distribution
   - characterize geological materials
   - characterize natural and anthropogenic subsurface features
   - checking for indications of climatic, health and environmental changes

c) describe components of surveys, for example:
   - data collection, e.g., equipment used, sampling methods, measurement
   - data processing
   - data interpretation
   - reporting

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B1.2 describe surface and groundwater testing

a) the study of the attributes of water

b) purposes include:
   - assessing environmental impacts
   - gathering baseline data
   - conducting impact and site assessments
   - determining health risks

c) methods may include:
   - using field instrumentation
   - collecting samples

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- making observations
- taking measurements

d) attributes studied may include
- physical qualities, e.g., colour, temperature, sediment
- chemical qualities, e.g., salinity, pH, oxygen
- contaminants, e.g., organic, inorganic, bacteria, hydrocarbons, trace metals, polychlorinated biphenyls (PCBs)
- biological qualities, e.g., micro-organisms
- features of water bodies, e.g., depth, type, shape, water level, water flow

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B1.3 describe soil testing

a) the study of the characteristics of soil
b) purposes include:
- acquiring baseline data
- determining physical properties
- determining condition of permafrost zone
- determining effects of activities on soil, wildlife, and vegetation
- assessing environmental changes
- conducting impact and site assessments
- determining the types and/or locations of land activities that could take place, e.g., mineral exploration, pipeline routing
- determining health risks

c) methods may include:
- describing soil profiles
- collecting representative soil samples, e.g., grab, core, bulk
- preserving and containing samples
- measuring particle sizes and composition
- taking measurements
- making observations

d) attributes studied may include:
- physical characteristics:
  - characteristics of underlying rock
  - number and depth of soil layers or horizons
  - parent materials
  - bulk density
  - moisture content
  - particle sizes
  - soil characteristics, e.g., soil type, particle size, soil texture
- chemical composition
- organic content, e.g., fraction of organic carbon (foc)
- contaminants

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- soil biology, e.g., micro- and meso-organisms

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B1.4 describe air testing

a) the study of attributes of indoor and outdoor (e.g., air shed) air quality
b) purposes include:
   - providing baseline data
   - describing current conditions
   - describing climate change
   - conducting impact and site assessments
   - determining health risks
c) methods may include:
   - sampling using equipment or instruments
   - automated monitoring
   - taking measurements
   - making observations
d) attributes studied may include:
   - chemical compositions
   - chemical emissions, e.g., sulphur dioxide (SO_2), carbon dioxide (CO_2), sulphuric acid (H_2SO_4)
   - total particulate matter, e.g., smoke, ash
   - air quality
e) measurements may include:
   - mass of particulates
   - speed and direction of the wind
   - concentrations of contaminants
   - ranges and distributions, e.g., spray drift

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B1.5 describe radiation testing

a) the assessment of radiation levels in the environment which may occur naturally or as a result of land activities
b) purposes may include:
   - assessing the radiation levels for mineral potential or contamination
   - conducting impact and site assessments
   - determining health risks
c) methods may include:
   - measuring radon gas
   - sampling water, soil and air

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- identifying minerals
- data collection

d) attributes studied may include:
- types
- levels
- source identification

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B1.6 describe permafrost testing

a) the assessment of the characterization of permafrost, e.g., depth of active layer, area extent of permafrost
b) purposes may include:
- assessing climate change
- defining local conditions
- identifying geotechnical characteristics, e.g., structural integrity
- assessing potential contaminant pathways
- assessing habitat changes
- conducting impact and site assessments

c) methods may include:
- measuring
- drilling/excavating

d) attributes studied may include:
- depth
- freeze/thaw conditions
- structure of ice crystals
- permeability (k-value)

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B1.7 describe noise level testing

a) the study of noise levels
b) purposes may include:
- providing baseline data
- describing current conditions
- conducting impact assessments
- determining health risks
- determining effects on wildlife

c) methods may include:
- making observations
- taking measurements
- automated monitoring

e) attributes studied may include:

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- source identification
- decibel levels
- wildlife behavioural changes
- health impacts, e.g., hearing, stress
- weather condition changes

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B1.8 describe sediment testing

a) the study of the characteristics of sediment
b) purposes include:
   - acquiring baseline data
   - determining aquatic conditions
   - characterizing land use input effects, e.g., agricultural, storm water discharge
   - determining effects of activities on aquatic system
   - assessing environmental changes
   - conducting impact and site assessments
   - determining aquatic health risks
c) methods may include:
   - taking sediment samples, e.g., grab, bulk
   - measuring grain size distribution and composition
   - taking measurements
   - making observations
d) attributes studied may include:
   - physical characteristics:
     - particle size
     - pore water
     - porosity
     - bulk density
     - moisture content
   - chemical composition
   - contaminants
   - sediment biology, e.g., sediment-dwelling organisms

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B1.9 describe hazardous material testing

a) the study of the identifying and characterizing hazardous material at a location
b) purposes include:
   - determining physical properties
   - identifying presence of hazardous materials

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- identifying contaminant levels
- conducting impact and site assessments
- identifying potential health risks

c) methods may include:
- taking samples
- making observations
- taking measurements

d) attributes studied may include:
- chemical composition
- physical characteristics and condition
- contaminants
- potential for migration

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B1.10 describe biota testing

a) the study of the characteristics of living organisms
b) purposes include:
- acquiring baseline data
- determining physical properties
- determining effects of activities on ecosystem
- assessing environmental changes
- conducting impact and site assessments
- determining health risks

c) methods may include:
- collecting plants
- identifying species
- trapping mammals, e.g., rodents
- collecting invertebrates
- collecting fish
- dissecting for specific organs
- taking measurements
- making observations

d) attributes studied may include:
- physical characteristics
- health indicators
- population size
- concentration of contaminants
- bio-indicators

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B. TECHNICAL KNOWLEDGE
B2. Describe Environmental Assessment Approaches and Processes

B2.1 describe types of environmental assessment

a) describe environmental impact assessment:
- identifies:
  - nature of the project (undertaking)
  - potential environmental impacts
  - mitigation associated with the project
- impact assessments can be triggered by specific situations, e.g., government funding, aboriginal lands, distance to waterways:
  - there are different triggers for federal and provincial/territorial impact assessments
- includes biophysical, socio-economic and cultural components
- may include public consultation

b) describe environmental site assessment:
- a phased approach to identify and assess site status regarding potential or known contamination

c) describe environmental audit:
- verifies compliance to established standards, e.g., regulations, standards, governmental or internal policy
- snapshot of moment in time
- typically involves the use of a checklist
- identifies requirements for improvements in environmental policies and procedures

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B2.2 possess knowledge of contaminants and their interaction with the environment

a) describe the sources-pathways-receptors model

b) describe contaminant groups, e.g. inorganic, organic, pesticides, including:
- potential health risks
- environmental impacts
- contaminant migration
- contaminant degradation

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B2.3 describe the steps in the environmental site assessment process

a) be aware that there are variations in approach to conducting a site assessment, e.g., Canadian Standards Association (CSA), Canadian Council Ministers of the Environment (CCME), Risk Based Corrective Action (RBCA)

b) step one includes the research and review of background information to identify evidence of potential or actual contamination, e.g., CSA Phase 1presents an acceptable standard of care; step one generally consists of:
- records review
- site visit
- interviews
- evaluation of information
- report(s) preparation

c) step two is defined as intrusive testing and/or sampling based on requirements identified in step one in order to confirm or refute the presence of contamination; it generally consists of:
- step one report and other records review
- sampling plan development
- site investigation plan development
- site investigation
- interpretation and evaluation of data
- report(s) preparation, including recommendations for future site investigations

d) step three is defined as further testing and sampling to determine the extent of contamination; it generally consists of:
- step one and two report and other records review
- sampling plan development
- detailed site investigation
- interpretation and evaluation of data
- risk evaluation
- report(s) preparation, including recommendations for remediation or site closure

e) describe steps that may occur after the site assessment process:
- developing remedial action plan
- implementing remedial action plan
- monitoring performance of remedial action plan
- preparing and submitting closure documents

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C. TECHNICAL SKILLS
C1. Conduct Document Research and Review

C1.1 collect information for site and project area

a) respect intellectual property rights regarding documentation
b) access document sources, for example:
   - libraries
   - archives
   - utility companies
   - federal, provincial, municipal offices, e.g., Department of National Defence
   - Internet
   - public health offices
   - property owner
c) collect documents from aboriginal bands:
   - liaise with aboriginal contact person
d) collect available documents:
   - aerial photographs from pre-development to current time
   - property use records, for example:
     - fire insurance maps
     - city directories
     - contaminated site and property-use registries
   - title search and assessment rolls:
     - history of ownership
     - certificates of possession
   - environmental reports
   - company records, for example:
     - site plans
     - building plans
     - permit records
     - production and maintenance records
     - hazardous building materials, e.g., asbestos, lead-based paints
     - site utility drawings
     - emergency response or contingency plans
     - spill reporting plans or records
     - chemical inventories and use
     - waste management records
     - WHMIS material data sheets
     - inventory of underground and above ground storage tanks
     - environmental audit reports
     - prior relevant reports and studies
   - geological, geotechnical and soils information
   - regulatory information, e.g., outstanding ministerial orders, water use records, permits and approvals
   - topographical maps
   - satellite photographs
   - agreements of purchase and sale
   - land use documents

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- climate and hydrographic information
- surface and groundwater monitoring records
- government reports, e.g., geological, hydrogeological
- public health advisories
- utility company records
- local information sources, e.g., historical societies, photographs, newspaper clippings
- other helpful information such as:
  - well logs or water well data base
  - inventories of waste disposal sites, PCB disposal sites, coal gasification plants, underground and above ground storage tanks
  - air, surface water and ground water quality data
  - waste generator registries
  - street directories
  - records from bands, regulatory agencies, e.g., INAC
  - historical site plans
  - utility lines gas, telephone, building location
  - heritage/cultural/archaeological resources
  - development permits
  - other authorizations

e) copy information from documents by hand when documents cannot be photocopied:
   - hand copy should be word for word
   - check accuracy and spelling
   - record name of source documents

f) print hard copies of information from internet web sites:
   - document website addresses

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C1.2 review information about site and project area

a) review information, e.g., documents, photographs, interviews
b) identify:
   - past and current land uses that could pose an environmental concern
   - baseline conditions
   - phases of development
   - changes to site over time
   - current monitoring activities

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C1.3 summarize findings

a) check information for accuracy
b) write clearly and legibly

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C. TECHNICAL SKILLS
C1. Conduct Document Research and Review

c) use plain language :
   - incorporate local terms when possible, e.g., place names

d) be concise

e) summarize key environmental information from documents, including:
   - past and current land uses of site and neighbouring sites
   - past and current occupants of site and neighbouring sites
   - findings of aerial photo review

f) highlight key areas of concern, e.g., land uses

g) make recommendations for further investigation based on review of research

h) record:
   - sources of information
   - information or documents that were not available
   - information pending

i) maintain organized file of all research documents including hard copy of web/internet research materials

j) proof read:
   - check for clarity
   - check for correct structure, grammar and spelling

k) submit summary with attached file of research documents to project team

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C. TECHNICAL SKILLS
C2. Use Mapping Skills

C2.1 describe maps

a) be aware that maps are created from:
- aerial photography
- control survey plans
- satellite imagery

b) identify the types of maps that may be used, for example:
- topographic
- resource
- geological
- bathymetric
- land-use zoning
- aerial photographs
- site plans
- legal plans
- field sketches
- road maps
- watershed
- marine charts

c) identify the types of information found on maps:
- name of area
- data
- datum
- co-ordinates
- map number
- scale
- legend
- declination, e.g., north arrow
- contour intervals
- natural formations, e.g., rivers, lakes, mountains
- other information depending on the purpose of the map, for example:
  - legal boundaries, e.g., land claim settlement areas, municipalities, regions
  - exploration and development sites, e.g., cut lines, mines
  - infrastructure, e.g., roadways, airports, rail lines

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C2.2 use maps

a) be aware of where to find maps, for example:
- Department of Natural Resources (DNR)
- libraries
- planning offices

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- archives
- museums
- Internet
- Councils
- provincial mapping services

b) talk to the project team to identify the correct map(s) for the purpose
c) locate on the map:
   - relevant structures/infrastructures in the field, e.g., buildings, watercourses, wetlands, geological features, wells, septic fields, fuel storage tanks, pipelines, buried cables
   - own position
   - property pins or survey pegs
   - special or sensitive areas
d) verify map information with the field
e) transpose information from field on to maps:
   - make corrections to maps, e.g., building in different location in the field than indicated on map
f) reference the map when recording information
g) clarify information with the project team, if required

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C2.3 use a compass

a) ensure accurate bearings:
   - follow manufacturer's instructions for care, maintenance and operation of compass
   - be aware that compass may not be effective in all areas, e.g., areas with sources of local magnetic fields such as high voltage wires, local ore deposits, areas above the arctic circle
   - prevent compass deviation by taking bearings away from steel, such as watch cases, tools, vehicles
b) take and record accurate bearings

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C2.4 use Global Positioning System (GPS)

a) use to:
   - mark way points
   - delineate areas
   - record elevations
   - assist with navigation from one position to another
   - provide precise locations, especially in absence of landmarks

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C. TECHNICAL SKILLS
C2. Use Mapping Skills

b) know what co-ordinate system and datum your GPS has been set at, for example:
   - latitude and longitude
   - Universal Transverse Mercator system (UTM):

c) follow the manufacturer's instructions for care, maintenance and operation of the GPS unit

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C. TECHNICAL SKILLS
C3. Use Vehicles

C3.1 operate and maintain land vehicles

a) identify types of transportation used, for example:
   - off-road vehicles, e.g., quads, snowmobiles
   - passenger vehicles, e.g., trucks, cars
b) follow company procedures for vehicles, hauling vehicle and trailer
c) use PPE as required
d) comply with applicable legislation:
   - possess correct operating licence
   - ensure registration and insurance papers are with vehicle
e) follow maintenance and operating guidelines, for example:
   - conduct pre-operational check
   - carry tools and extra fuels, fluids and parts (e.g., plugs, belts) for operation and repair
f) maintain control of vehicle at all times
g) follow site-specific operation requirements, e.g., speed limits, parking
h) inform project team of problems or maintenance deficiencies

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C3.2 operate, maintain and transport watercraft

a) identify types of watercraft used, e.g., motorboat, canoe
b) follow company procedures for watercraft, hauling vehicle and trailer
c) comply with applicable legislation:
   - carry required safety equipment and emergency kit
   - possess correct operating licence
   - ensure registration and insurance papers are with watercraft
d) follow maintenance and operating guidelines, for example:
   - conduct pre-operational check
   - carry tools and extra fuels, fluids and parts for operation and repair
e) be familiar with capabilities and limitations of watercraft, hauling vehicle and trailer, for example:
   - handling characteristics and techniques
   - balance requirements
   - carrying capacity
   - anchoring techniques
   - on-board electronic devices, e.g., depth sounder
f) adhere to safety guidelines
g) maintain control of watercraft at all times
h) monitor traffic on waterway, e.g., other watercraft, float planes

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i) recognize potential hazards, e.g., buoys, sand bars, logs, swift currents or eddies, ice wedging
j) inform project team of problems or maintenance deficiencies

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C3.3 load and board aircraft

a) follow pilot's instructions
b) be aware of potential hazards, e.g., propellers, flaps, struts, rotors
c) for fixed wing:
   - board aircraft only upon pilot's permission
d) for helicopter:
   - complete a helicopter safety training and/or training, e.g., HUET (helicopter underwater escape training), Ground Crew Safety Orientation
   - wear appropriate PPE, e.g., hearing protection
   - follow the pilot's instructions when approaching or leaving the helicopter

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C. TECHNICAL SKILLS
C4. Conduct Site Visits

C4.1 prepare for site visit

a) discuss work program with project team:
   - identify any areas that are sensitive or should not be accessed, e.g., archaeological sites, condemned building
   - review site-specific health and safety plan and emergency response plan

b) contact land owner to set date and time for visit:
   - understand conditions of access

c) determine utility locates:
   - contact utility companies for overhead and underground utilities information
   - collect maps and transfer to working documents for use in the field
   - be aware that information from utility locates is not always accurate:
     - apply alternate field verification methods, if required, e.g., use daylighting

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C4.2 prepare for sampling and testing

a) discuss work program with project team
   - identify any areas that are sensitive or should not be accessed, e.g., archaeological sites, condemned building
   - review site-specific health and safety plan and emergency response plan
   - review standard operating procedures (SOPs) related to sampling and testing

b) take specialized training to use sampling and testing equipment correctly, if applicable, e.g., permafrost testing, radiation testing

c) contact land owner to set date and time for visit:
   - understand conditions of access

d) gather and check required equipment, tools and supplies for sampling and testing, for example:
   - well materials, e.g., plastic piping, caps, fittings
   - coolers and ice packs
   - camp supplies
   - notebook and writing supplies, e.g., waterproof marker
   - flashlight with extra batteries
   - survival, safety and emergency equipment
   - field and sampling equipment, e.g., hand auger, sample containers, cooler
   - personal protective equipment (PPE), e.g., rubber gloves, goggles, coveralls, footwear, hard hat, face mask

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- communication equipment, e.g., cell phone, radio, satellite phone
- relevant documents, e.g., maps, surveys, reports

e) familiarize yourself with how the equipment should be operated:
   - calibrate equipment

f) repair or replace missing or damaged items
g) follow guidelines for safe travel and field work
h) assist with shipping and tracking of tools and equipment, as required

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C4.3 visit site

a) observe site conditions and verify information found during document research and review
b) confirm or revise work plan with supervisor
c) document site conditions on field sketch and in field notes:
   - take and label photographs, if allowed
   - record locations of site features on GPS and/or field sketch, if applicable, e.g., location of utilities
   - take measurements, as appropriate to the site, e.g., distance to nearest surface water body, angles and lengths of slopes, distances between buildings, distance to neighbouring properties

d) note potential sources of contamination, for example:
   - above and underground storage tanks
   - fill and vent pipes
   - chemical storage, e.g., drums, pails, plastic containers, paint cans
   - oil-water separators, e.g., vehicle hoisting equipment
   - truck and rail loading areas, e.g., creosote ties
   - building features, for example:
     - floor drains or sumps in existing buildings
     - cracks in floors near drains and catch basins
     - stained ceiling tiles, baseboards, walls or floors
     - materials potentially containing asbestos, lead, mercury, PCBs, ozone depleting substances or other hazardous materials
     - rodent and bird droppings

e) note pathways for potential migration of contamination, for example:
   - drainage pathways
   - geological features, e.g., soil type, bedrock outcrops
   - movement of dust
   - wind patterns
   - relative surface topography
   - presence and type of vegetation in contaminated areas

f) note potential receptors, for example:
   - surface and ground water

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- critical habitats
- humans

g) note signs of environmental concern, for example:
- existing monitoring wells
- stressed vegetation, e.g., algae blooms
- surface staining, e.g., discolouration of ground materials
- tailings or waste rock
- discoloured surface water
- remnants of structures
- unusual features, e.g., mounds
- debris
- odours

h) note other relevant information, for example:
- physical obstructions, e.g., overhead utilities, ditches
- access and egress to site
- rights-of-way

i) check neighbouring properties for potential contaminating land use activities:
- observe conditions from site property line or publicly accessible area if neighbouring property is not accessible

k) before leaving site (daily or at the end of the job):
- review work completed, e.g., what you did vs what you came to do
- review field notes, samples, photographs for complete and accurate information
- follow up as required, e.g., inform supervisor of work completed

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C5.1 operate sampling equipment

a) select appropriate sampling tool for the material being sampled including:
   - soil sampling equipment, for example:
     - hollow and solid stem augers used to bore holes and take soil samples
     - split spoon sampler used to collect soil samples and identify soil density
   - ground water sampling equipment, for example:
     - sampling pumps used to bring ground water to surface
     - tubing and foot valve used to bring ground water to surface
     - bailers used to collect a sample of ground water from a specific depth
   - surface water sampling equipment, for example:
     - water depth sampler used to take samples at specific depths
     - bathymetric equipment
   - sediment sampling equipment, for example:
     - grab-sampler used to bring sediment to the surface
   - hazardous materials (e.g., asbestos, lead, PCBs, liquids in barrels, landfill leachate, sewage) sampling equipment, for example:
     - scraper used to remove solid materials
     - pipette/sample bottle used to extract liquid samples
     - swab used to collect surface samples
   - biota (vegetation and wildlife) sampling equipment, for example:
     - traps used to collect live mammals
     - trowel used to collect vegetation
   - air quality sampling equipment, for example:
     - personal sampling pump used to collect air samples
b) follow operating and maintenance guidelines, for example:
   - operating speeds if applicable
   - appropriate condition of material being collected
c) operate sampling tool to collect sample as specified in sampling protocol
d) clean and store sampling equipment as directed and according to manufacturer's guidelines

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C5.2 operate testing equipment

a) select the correct equipment for the required measurement, for example:
   - photoionization device (PID) used to measure combustible vapours in head space of collected samples
   - water level probe used to measure depth of the water table
   - interface probe used to measure thickness of liquid levels
   - survey levels used to measure land elevations
   - pH meter used to measure acidity/alkalinity of liquids
   - conductivity meter used to measure the electrical conductivity to determine salinity
   - dissolved oxygen meter used to measure the amount of oxygen
   - thermometer used to measure temperature
   - field test kits used to measure chemical levels, e.g., hydrocarbon
   - gradiometer used to find buried metal objects underground, e.g., fuel tanks
   - radon monitor used to measure radiation
b) calibrate or initialize the equipment:
   - record results according to SOP
c) go to the specified location:
   - check for the location marker or verify the way point
d) operate the equipment:
   - calibrate, if required
e) take the measurement or reading:
   - reset the equipment, if required
f) record the data in your field notes:
   - note all aspects of your observations
g) report any unusual results to the project team:
   - follow up as directed, e.g., check and/or replicate measurement

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C5.3 follow sampling protocols

a) follow instructions for selecting sample locations
b) follow the protocol for the type of sample being taken
c) follow quality assurance and quality control (QAQC) protocols:
   - ensure that the sample is not contaminated, e.g., wear gloves
   - label and number the sample container
   - preserve as required, e.g., add preservatives
   - store and transport samples as required

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- record information clearly and correctly on field notes, sample labels and site plan, e.g., location, date, time, type of sample
- complete your section of the chain-of-custody documents as instructed

d) field screen samples:
- select appropriate instrument to test samples
- select and submit samples for further testing as directed

e) advise the next recipient that samples are enroute:
- provide waybill number

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C5.4 take readings from monitoring instrumentation

a) understand the importance of following protocols precisely, e.g., consequences for results
b) identify equipment that must have readings taken on regular basis, e.g., monitoring well, weather station
c) install or set up the instrumentation
d) take the measurement or reading
e) record the data in your field notes
f) maintain or reinstall the instrumentation, if necessary
g) report any unusual results to your project team

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C6.1 take field notes

a) be aware that all documentation, e.g., field notes, journals, logbooks, reports, photographs, sample results, and log sheets, can be used in a court of law
b) use forms and notebooks supplied by employer, regulatory agencies or clients:
   - use notebooks as directed
   - number the pages or sequence of activities
   - do not rip pages out
   - write or print legibly
   - cross out mistakes with a single line:
     - initial corrections
     - do not erase mistakes
   - use a pencil or pen as directed
   - save hard copies of field notes
c) use electronic recording devices, e.g., PDA, tablet computer, if provided:
   - double-check all data entry for accuracy
   - indicate which is latest version of data
   - save back up copies and hard copies
d) use appropriate language, e.g., avoid using slang terms, use correct technical terms
e) provide all the required information, including:
   - own name
   - time
   - weather
   - date
   - place/project name
   - location co-ordinates
   - who you are with
   - observations:
     - may include project team members' requests for specific observations, e.g., time a contractor was working on site
   - activities
   - recommendations
f) record information as soon as possible
g) be concise and clear
h) transfer sketches to appropriate documents and/or copy field notes as required
i) when sampling:
   - record all necessary details about the sample, i.e., who, what, where, when, why and how the sample was taken as well as the sample identification (ID) number

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- enter information directly into database, if applicable
- note completion of chain of custody documents

j) reference photographs and/or sketches that correspond to observations and notes
k) maintain personal record of activities, e.g., when you contacted the office for further field instructions
l) make a copy of your daily notes and provide to the project team:
   - do not throw anything away

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C6.2 take photographs or videos

a) confirm that you are authorized to take photographs or video, i.e. from project leader, e.g., have copy of written conditions of work:
   - confirm there are no issues with proprietary information and/or security when you arrive on site
b) make sure it is safe to take photographs or video, e.g., away from explosive environments
c) follow manufacturer's instructions for care, use and maintenance of the camera
d) take useable photographs or video:
   - consider lighting conditions
   - position yourself close enough to the object to capture its details
   - use a familiar object to provide a reference for scale, e.g., pencil, tape measure, field book
   - take photographs or video from different positions, if possible
e) record description of photograph in field notes, for example:
   - date and time
   - name of site
   - subject
   - frame/image number
   - film or memory card number
   - orientation of the photograph, e.g., picture taken from south looking east
f) provide commentary on video, for example:
   - date and time
   - name of site
   - subject
   - orientation, e.g., taken from south looking east
g) note location on map or field sketch or in field notes
h) develop film or download photos/video promptly
i) keep photo or video log:
   - record frame/image number, description and date
j) store photographs or video as directed
k) make copies as directed

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C. Technical Skills
C6. Document Field Observations

C6.3 make field sketches

a) use a copy of the existing site plan or satellite/aerial photo as a base for sketch, if available:
   - do not write on original
b) indicate scale or size of object
c) sketch or mark:
   - location of utilities
   - location and configuration of buildings
   - surface features, e.g., asphalt, grass, gravel, concrete, retaining walls, vegetation, direction of drainage flow
   - photograph locations and directions
   - measurements
   - environmental concerns
   - geographical features
   - sample locations, e.g., monitoring well, test pit
   - property boundaries
d) record description of sketch in field notes, for example:
   - date and time
   - name of site
   - subject
   - orientation of the sketch, e.g., as seen from south looking east
e) use common symbols, e.g., for catch basins, power lines:
   - create legend to explain symbols
f) indicate north using an arrow, if possible
g) use arrows to connect comments about environmental concerns to field sketch markings

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D. Health and Safety
D1. Demonstrate Health and Safety Skills

D1.1 learn safety procedures for company and project sites

a) familiarize yourself with:
   - company safety manual, e.g., policies and procedures
   - equipment and safe operating procedures
   - site-specific procedures
   - emergency response plans
   - occupational health and safety plans
   - location and operating procedures for safety equipment

b) use local knowledge to help develop the site-specific health and safety and emergency response plans, if appropriate

c) attend regular health and safety meetings, as required, e.g., tail-gate meetings

d) take safety training as required, for example:
   - Standard or Marine Advanced First Aid and CPR
   - wildlife safety, e.g., bear awareness
   - vehicle safety, e.g., boat safety, helicopter safety
   - chemical safety, e.g., Workplace Hazardous Materials Information System (WHMIS), H_2S (Hydrogen Sulphide) Alive, hazardous spill training
   - equipment operation, e.g., firearm safety, chainsaw safety
   - Transportation of Dangerous Goods (TDG)
   - workplace safety, e.g., fire safety, trenching safety

e) attend regular health and safety meetings, as required, e.g., tail-gate meeting

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D1.2 follow guidelines for personal safety

a) notify employer/co-workers of your work plan and daily activities

b) notify project team of any personal health concerns, e.g., allergies, medical conditions

c) wear appropriate personal protective equipment (PPE), e.g., safety glasses, steel-toed boots, hard hat, hearing protection:

d) wear appropriate clothing for weather/environment/activity

e) ensure that clothing and PPE fit properly

f) be aware of your surroundings, e.g., watch for hazards

g) be aware of own fears and do not exceed own limitations, e.g., fear of heights, level of physical strength

h) notify supervisor and co-workers of personal health conditions, e.g., severe allergic reactions

i) be aware of your right to stop work if conditions become or appear to be unsafe

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j) take precautions if unsure of site conditions, e.g., have particulate/aerosol breathing apparatus available if it might be required
k) be aware of hazards, for example:
   - moving equipment, e.g., heavy equipment, drill rigs
   - overhead wires and lines
   - open test pits and trenches
   - thin ice
   - slippery surfaces
   - fast flowing water
   - extreme weather
l) be cautious around containers without labels, as the containers may contain dangerous materials
m) have communication equipment available at all times, e.g., cell phone, satellite phone
n) base work activities on current conditions:
   - do not overexert yourself in extreme temperatures

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D1.3 follow guidelines for safe travel and field work

a) create a trip plan that specifies:
   - date and time of departure
   - expected date and time of return
   - destination
   - route and alternate route
   - emergency contact numbers
   - mode of travel
   - reporting requirements at departure and arrival
b) share the trip plan with appropriate individuals, e.g., co-workers, supervisor, safety officer
c) follow guidelines for handling and storing fuel, for example:
   - store fuel tanks properly, e.g., caps are secure
   - refuel in ventilated areas away from open flames
d) listen to the weather forecasts and fire risk reports if travelling to remote location
a) report in upon your arrival and return
b) perform last minute risk assessment on site, e.g., identify slippery or unstable ground, look for presence of tripping hazards, be aware of presence of wild or domestic animals, confined spaces
c) respond to hazards, e.g., for blizzards find shelter and stay put, stay out of the way of moving equipment
d) be aware of your right to refuse work if conditions become unsafe

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e) do not exceed limitations of your method of transportation, e.g., do not overload a boat

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D1.4 follow guidelines for lifting

a) be aware of ground surface conditions, e.g., snow, ice, stairs, unstable or unlevel ground
b) consider size and weight of article to be lifted:
   - ask for assistance with very large or heavy objects
c) use mechanical or moving devices when possible, e.g., fork lift, dolly/hand cart
d) to lift a heavy object:
   - get close to the object
   - keep your back straight
   - bend your knees
   - lift with your legs rather than your back
   - lift with a smooth motion
   - turn your whole body:
     - do not twist your upper torso
   - carry the load close to your body

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D1.5 describe Workplace Hazardous Materials Information System (WHMIS)

a) a Canada-wide communication system for sharing information about hazardous materials used on a job site:
   - explains hazards and how to control and prevent chemical accidents
b) consists of three components:
   - a labelling system gives basic information about hazardous materials
   - material safety data sheets (MSDS) contain additional detailed information about use, storage and hazards
   - an employee education and certification program
c) hazardous materials are classified into six categories:
   - Class A – compressed gases
   - Class B – flammable and combustible materials
   - Class C – oxidizing materials
   - Class D – poisonous and infectious materials
   - Class E – corrosive materials
   - Class F – dangerously reactive materials

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D. Health and Safety
D1. Demonstrate Health and Safety Skills

Note: WHMIS is a mandatory training certification program. All EA Assistants must take WHMIS training. The description of WHMIS in this document serves as a reference only.

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D1.6 be familiar with emergency response procedures and protocols

a) be aware of your responsibilities in the event of a health and safety or environmental emergency
b) identify potential types of emergencies associated with the site activities, e.g., risk of injury, risk of fire, risk of equipment breakdown, risk of hazardous material release, risk of natural disaster
c) follow general emergency response protocols, for example:
   - be familiar with hazard communication systems, i.e., local emergency response contact information
   - follow directions of appropriate authorities
   - follow evacuation protocols
   - respond to minor emergencies, i.e., a small fires, minor hazardous material releases, minor injuries
d) document details of your involvement in the emergency response, including:
   - time and location
   - nature of the occurrence
   - procedures followed

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D1.7 follow guidelines for drill rig safety

a) familiarize self with site specific health and safety plans, e.g., where to stand, smoke or use cell phone
b) wear required PPE, e.g., high visibility vest, hard hat, CSA approved footwear
c) be aware of the presence of flammable vapours
d) position self in safe location when on site, for example:
   - stand out of way of the driller
   - be aware of overhead lines if moving equipment or vehicles
e) use caution around operating equipment
f) avoid assisting driller unless you are trained to do so

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D. Health and Safety
D1. Demonstrate Health and Safety Skills

D1.8 follow guidelines for excavation site safety

a) familiarize self with site specific health and safety plans, e.g., locations of entrances and exits, hand signals
b) wear required PPE, e.g., high visibility vest, hard hat
c) be aware of the presence of flammable vapours
d) maintain an awareness of ground stability:
   - be aware of the potential for earth collapse
e) do not step into an open excavation
f) position self in safe location when on site, for example:
   - stand away from the open excavation and moving equipment
   - do not stand on equipment tracks
   - do not stand in the operator's blind spot, e.g., behind the equipment
g) do not direct the excavator operator
h) be aware of traffic patterns of vehicles on site

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E. PERSONAL SKILLS
E1. Possess Personal Skills

E1.1 maintain professionalism

a) be:
   - adaptive, e.g., change your way of working to different organization's procedures
   - communicative, e.g., speak up when you know a plan will be difficult to implement
   - honest
   - responsible, e.g., arrive at work on time, follow through on commitments
   - respectful, e.g., show appreciation for other team member's efforts, demonstrate cultural and gender sensitivity
   - tactful, e.g., speak positively about the organization you are working for

b) have a positive attitude, e.g., co-operate with team members, participate actively in team meetings

c) act as a role model, for example:
   - speak positively about the occupation
   - model high standards of work

b) be aware of your own limitations, for example:
   - identify your own skill levels
   - if unsure of how to carry out a task, ask for help

d) be able and willing to work in adverse conditions such as bad weather, remote locations

e) manage your own stress:
   - identify your own 'anger triggers'
   - do not escalate situations
   - be proactive, e.g., remove yourself from a situation if necessary to remain calm

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E1.2 be ethical

a) respect confidentiality of the client:
   - do not discuss confidential information
   - do not discuss organizational issues within the community
   - assume all information is confidential unless instructed otherwise

b) ensure messages between all parties (e.g. community, organization, contractors) are presented accurately and respectfully

c) declare "conflict of interest" situations

d) remain neutral, for example:
   - respect others' values and beliefs
   - respect others' opinions and points of view

e) keep activities within the scope of the work

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f) inform supervisor/project team of personal or ethical conflicts

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E1.3 solve problems

a) identify the problem, e.g., need to access an individual's private property, equipment break-down
b) discuss problem with supervisor/project team, if possible, for advice or input
c) determine if problem is within your own limits of authority and/or ability
d) identify possible solutions while considering:
   - consequences of different options, e.g., costs, emotional reactions of individuals
   - organization's policies and procedures
   - resources available
e) determine best solution
f) implement the solution
g) follow up on the problem, for example:
   - document the problem and file for future reference
   - communicate the situation and solution to co-workers
   - make suggestions to help avoid similar problems in the future

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F. COMMUNICATION SKILLS
F1. Demonstrate Communication Skills

F1.1 follow communication plan

a) understand reporting structure, including:
   - who has final authority for decision-making
   - what information is to be communicated to whom
   - who to go to in case of a problem
   - who to go to to request information
   - when information should be communicated
   - what form a message should take, i.e. written or verbal
b) communicate information to the appropriate individual:
   - communicate messages in clear, concise language
   - use vocabulary to suit the person being communicated to and the situation
c) refer any media questions to the appropriate individual:
   - never answer media questions

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F1.2 liaise between community members, organizations and experts

a) identify communication needs and expectations of group or individual to be communicated to, including:
   - language
   - vocabulary
   - education level
   - amount of information desired
b) transmit messages clearly between parties in a timely manner:
   - be respectful
   - communicate messages in clear, concise language
   - use appropriate vocabulary
c) communicate information about known or potential environmental concerns clearly:
   - be honest about risk without exaggerating or causing unnecessary fear
d) participate in public forums, as required:
   - be prepared, e.g., know the subject
   - present information clearly
   - speak to the audience
e) participate in presentations, for example:
   - interpret technical terms for the audience
   - answer questions:
     - refer questions to project team if you cannot answer
f) answer questions and provide advice to parties, as appropriate, e.g., cultural protocols in the community

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F. COMMUNICATION SKILLS
F1. Demonstrate Communication Skills

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F1.3 interview individuals

a) follow appropriate protocols, for example:
   - cultural, e.g., gifting, correct way to approach Elders
   - business practices

b) work with the project team to:
   - develop questions to be asked
   - prepare interview form
   - identify appropriate individual(s) to contact

c) contact individual(s) to be interviewed:
   - arrange for a mutually agreeable time and place for the interview
   - explain what you will be asking about and what will be done with the information

d) provide consent forms for individual(s) to sign, if applicable

e) conduct interview at agreed upon time:
   - walk around site with interviewee, if possible
   - record the answers to questions in the interviewee's words
   - use recording devices, if applicable, e.g., voice recorders
   - use clear, concise language
   - use appropriate vocabulary
   - use a variety of question types, e.g., open- ended, probing
   - ensure accuracy, e.g., spelling of names, information recorded

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G. PROJECT ADMINISTRATION
G1. Assist with Project Administration

G1.1 possess knowledge of legislation

a) distinguish between an Act, Regulation, code of practice, guideline, and policy
b) be aware of why the piece of legislation exists and what it includes, for example:
   - Canada Labour Code:
     - purpose is to protect workers
     - includes occupational health and safety legislation at the federal level
   - Canadian Environmental Protection Act (CEPA):
     - exists to protect the natural environment and human beings
     - contains many regulations, including PCB storage, handling of ozone depleting substances, handling of environmental emergencies
   - Canadian Environmental Assessment Act (CEAA):
     - exists to define the process and requirements for federal environmental assessment
   - Fisheries Act:
     - exists to protect fish and fish habitats, including waterways, ditches that lead to waterways, storm sewers
   - Navigable Waters Protection Act (NWPA):
     - exists to protect navigable waters from unauthorized construction works
   - Species at Risk Act (SARA):
     - exists to protect species at risk
     - contains requirements for assessing potentially threatened/endangered species and their habitat(s)
   - Transportation of Dangerous Goods Act (TGD):
     - exists to protect public from potential exposure to dangerous goods
     - includes requirements for what can be transported, documentation requirements for transport, and packaging of goods for travel
c) know where to find copies of the legislation for reference
d) be aware that provinces/territories and regional/local governments may have their own environmental, natural resources, heritage and/or occupational health and safety legislation

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G. PROJECT ADMINISTRATION
G1. Assist with Project Administration

G1.2 possess knowledge of regulatory agencies

a) identify relevant agencies, e.g., public health units, fire department, heritage/cultural resources, federal and provincial environment/natural resources department, conservation authority
b) identify how to contact the relevant agencies:
   - note procedures for requesting/documenting information from agency, e.g., Internet, phone, mail, fax

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G1.3 contribute to project planning

a) understand the planning process and how the use of resources and scheduling impacts planning
b) understand that a budget is a list of estimates of revenues and expenditures for a period of time
c) understand how the health and safety plan is integrated into project planning
d) understand local factors and considerations that will affect field work, e.g., seasonal activities, weather conditions, road conditions, transportation, community events
e) contribute to the budgeting process, e.g., obtain estimates or prices for local goods and services
f) encourage the use of local Aboriginal expertise, resources and businesses whenever possible
g) identify opportunities to build capacity, e.g., purchase new equipment, develop specific skills training/apprenticeship
h) provide local knowledge to supervisor/project team during the planning process, e.g., local wage scales, reliable local contractors, access routes and methods of transportation available, accommodation available, safety issues and essential services in the area
i) identify how the project plan may affect the community
j) participate in meetings about project planning and/or progress
k) communicate any concerns with the plan to supervisor/project team

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G1.4 use the computer

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G. PROJECT ADMINISTRATION
G1. Assist with Project Administration

a) learn basic functions of the computer, e.g., turn on and off, troubleshoot problems, set up and change passwords, copy and save files
b) use software, e.g., word processing, spreadsheet, database, presentation
c) use the Internet:
   - search/research information:
     - confirm reliability of information as needed
   - use on-line mapping tools
   - send and receive e-mail
d) use hardware, for example:
   - printer to produce hard copies of computer documents
   - scanner to replicate images or documents
   - projector to make presentations
e) back up data, e.g., burn CD, save to jump drive, save to network

***Bolded subskill statements indicate performance standards**

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