Pipeline Equipment Operator/Excavator

Provincial Occupational Analysis

19 April 01
9 May 01
22 May 01
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<td>Knowledge of unsafe tools, such as mushroomed heads, split handles, frayed cables, bulged hoses, poor electrical connections</td>
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<td>A1.9 Uses and maintains tools and equipment</td>
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<td>A1.12 Identifies climate extremes</td>
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<td>Knowledge of safe operating techniques for general shop equipment</td>
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<td>Knowledge of methods for extinguishing types of fires and</td>
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<td>Knowledge of storage and handling of flammable materials, liquids and gases (including Propane, Acetylene)</td>
<td>Knowledge of explosion and implosion hazards</td>
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<tr>
<td>Ability to identify explosion and implosion hazards</td>
<td>Knowledge of site evacuation procedures</td>
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<td>Knowledge of responses to extreme weather conditions</td>
<td>Knowledge of impact of climate conditions on personnel and equipment</td>
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<td>Knowledge of alternative methods for performing work in wet, cold and icy conditions</td>
<td>Ability to identify changes/modifications for methods of work to be performed</td>
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<td>Knowledge of Occupational Health and Safety Act and Regulations</td>
<td>Knowledge of WHMIS legislation</td>
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<td>Ability to operate fire extinguishers</td>
<td>Ability to maintain and adjust personal protective equipment</td>
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<td>Knowledge of types of personal protective equipment</td>
<td>Knowledge of dangers associated with jewelry, loose clothing and long hair when working with</td>
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<tr>
<td>machinery Knowledge of location of emergency safety equipment Knowledge of operating procedures for safety equipment Knowledge of emergency phone numbers and Hospital locations Ability to maintain first aid kits Knowledge of site safety rules and regulations Ability to estimate weights of materials Knowledge of lifting equipment capacity Knowledge of slings, hooks, chains and shackle capacity Ability to inspect rigging Ability to calculate safe working loads for various rigging Knowledge of load charts Knowledge of lifting points Ability to identify proper lifting points Knowledge of manufacturers’ designed equipment, ie bucket Knowledge of hazards associated with working with hydraulic and pneumatic systems Knowledge of first aid Knowledge of CPR Ability to apply first aid Ability to apply CPR Knowledge of appropriate grounding techniques for electrical equipment/tools</td>
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<td>Ability to recognize hazards associated with electrical equipment</td>
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<td>Knowledge of safe towing/recovery procedures using slings, chains and cables</td>
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<td>Ability to demonstrate safe towing practices</td>
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<td>Knowledge of hand signals and protocol</td>
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<td>Ability to give hand signals</td>
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<td>Knowledge of light, flag and audible signals</td>
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<td>Knowledge of safe boosting procedures</td>
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<td>Ability to assist and apply safe boosting procedures</td>
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<td>Knowledge of equipment lockout procedures</td>
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<td>Knowledge of flagging</td>
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<td>Knowledge of signage</td>
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</table>
| A2. Communication | A2.1 Communicates with management  
A2.2 Communicates with inspection and land owners  
A2.3 Communicates with job site personnel  
A2.4 Communicates with apprentices  
A2.5 Completes written communication | Knowledge of general type of work to be performed  
Knowledge of excavator operations  
Ability to interpret sketches and written instructions  
Ability to communicate verbally  
Knowledge of the importance of clarifying job requirements  
Knowledge of the importance of positive land owner relations  
Ability to communicate effectively  
Knowledge of procedures and forms for reporting injuries  
Ability to complete forms and documentation  
Knowledge and understanding of pipeline terminology  
Ability to determine if job complies with acts and regulations  
Ability to maintain client and other 3rd party relations  
Knowledge of role and importance of signal person  
Knowledge of job and roles and responsibilities of site personnel  
Ability to identify and discuss important elements of job with site personnel  
Knowledge of levels of authority of site personnel |
| Knowledge of theoretical and practical knowledge and skills for excavator operation |
| Ability to model safe work practices to apprentices |
| Ability to instruct and educate apprentices and provide feedback on their performance |
| Knowledge of regulations and policies governing log books |
| Ability to maintain log books |
| Knowledge of the importance of work site documentation |
| Ability to complete records and documentation properly |
| Understanding of 2 way communication procedures |
| Ability to operate 2 way communication equipment |
| A3. Transports Equipment | A3.1 Prepares machine for transport  
A3.2 Load machine on trailer  
A3.3 Secure machine on trailer  
A3.4 Unload machine | Ability to prepare machine for transport  
Knowledge of machine and attachment weights  
Knowledge of transport weight restrictions  
Ability to attach/detach equipment attachments  
Ability to load/unload machine  
Ability to position machine and attachments on trailer  
Knowledge of machine tie-down Points  
Knowledge of chains and other hold down devices  
Knowledge of safe rigging practices  
Knowledge of various types of trailers  
Awareness of applicable acts and regulations for the transportation of heavy equipment and dangerous goods  
Knowledge of safe operating distances from power lines |
### A4. Environmental issues

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<th>A4.1</th>
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<td>A4.2</td>
<td>Performs right of way clearing operations</td>
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<td>A4.3</td>
<td>Strips top soil</td>
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<td>A4.4</td>
<td>Backfills and compacts ditch lines and graded cuts</td>
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<td>A4.5</td>
<td>Restores right of way</td>
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<td>A4.6</td>
<td>Assists emergency crews</td>
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</table>

- Knowledge of various cleaning practices
- Knowledge of cleaning products and equipment
- Knowledge of regulations for containment of materials when cleaning equipment
- Knowledge of oil and lubricant disposal regulations
- Ability to operate various cleaning equipment
- Knowledge of environmental regulations for right of way removal of trees, top soil and subsoil
- Ability to ensure natural drainage is maintained
- Ability to restore drainage patterns and contours as per environmental requirements
- Ability to restore right of way according to environmental regulations
- Knowledge of Canadian Association of Petroleum Producers environmental procedures (CAPP)
- Ability and willingness to assist outside agencies in emergencies (fire, flood, etc)
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<th>Knowledge, Skills &amp; Abilities</th>
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<td>B. Equipment Inspection and</td>
<td>B1. Performs preventive and predictive</td>
<td>B1.1 Checks fluid levels</td>
<td>Knowledge of manufacturers preventative maintenance requirements</td>
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<tr>
<td>Maintenance</td>
<td>maintenance</td>
<td>B1.2 Inspects and cleans equipment</td>
<td>and specifications</td>
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<td>B1.3 Conducts walk around inspections</td>
<td>Ability to interpret manufacturer's maintenance schedules</td>
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<td>Ability to follow and perform maintenance check list from manuals</td>
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<td>Knowledge of locations of fluid dipsticks and inspection ports</td>
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<td>Knowledge of physical properties of lubricants</td>
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<td>Knowledge of manufacturers fluid level specifications and</td>
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<td>inspection procedures</td>
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<td>Knowledge of manufactures fluid/lubrication specifications</td>
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<td>Knowledge of walk-around inspections</td>
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<td>Ability to inspect static equipment for abnormal conditions</td>
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<td>such as wear, leaks, loose components, unsafe conditions, track</td>
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<td>adjustment and general equipment condition</td>
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<td>Understanding of the importance of changing fluids</td>
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<td>Knowledge of procedures for reporting equipment faults</td>
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<td>Knowledge of proper fueling procedures</td>
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| B2. Performs pre-operational checks | B2.1 Inspects and services engine systems  
B2.2 Inspects and services air systems  
B2.3 Inspects and services electrical systems  
B2.4 Inspects and services hydraulic systems  
B2.5 Inspects and services chassis and running gear components  
B2.6 Inspects swing and propel unit  
B2.7 Inspects boom, dipper stick and hoe bucket  
B2.8 Inspects and services operating controls  
B2.9 Inspects monitoring and warning systems  
B2.10 Cycles systems and checks machine functions | Basic understanding of engine systems, the components and their operation  
Knowledge of company inspection procedures  
Ability to change filters and engine oil  
Knowledge of oil and lubricant disposal regulations  
Knowledge of lubricant storage techniques and regulations  
Ability to read gauges  
Knowledge of pre-start inspections  
Ability to bleed fuel systems  
Basic understanding of air intake systems and their operation  
Ability to change air filters and service air intake systems  
Basic understanding of electrical systems and their operation  
Knowledge of wiring and fuses  
Ability to change fuses and bulbs  
Ability to inspect, clean and test batteries and cables  
Basic understanding of hydraulic systems and their operation  
Ability to change hydraulic filters and hoses  
Basic understanding of the chassis and running gear components and their operation  
Ability to adjust track tension |
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<th>Knowledge of track grousers</th>
<th>Ability to select track grousers and proper spacing and placement</th>
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<td>Basic understanding of engine cooling systems</td>
<td>Ability to check for component wear and undue stress</td>
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<td>Ability to grease chassis and drive train</td>
<td>Knowledge of manufactures specifications for slings</td>
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<td>Knowledge of operating systems, components and attachments</td>
<td>Ability to inspect, adjust and set required components and attachments</td>
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<td>Ability to check bucket lifting device</td>
<td>Ability to replace bucket teeth and side cutters</td>
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<tr>
<td>Knowledge of monitoring and warning systems / components</td>
<td>Knowledge of excavator controls and factors that could affect excavator functions (snow, ice, rain, wind, mud)</td>
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<td>Ability to cycle all systems and evaluate machine functions</td>
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| B3  Performs continual checks | B3.1 Monitors all gauges and indicators  
B3.2 Monitors all excavator systems and functions  
B3.3 Monitors machine performance | Knowledge of excavator systems and appropriate gauges  
Knowledge of manufacturers recommendations  
Ability to interpret gauges and indicators  
Ability to monitor operational systems and components  
Knowledge of various warning systems  
Ability to monitor warning systems  
Knowledge of machine hazards such as excessive wear, weather limitations and structural stress  
Ability to monitor machine performance  
Ability to troubleshoot unusual noises  
Ability to follow troubleshooting charts |
| B4  | Performs minor repairs | B4.1 Identifies needed repairs  
B4.2 Replaces damaged or worn components  
B4.3 Ensures maintenance order is completed | Knowledge of the roles and responsibilities of operators and technicians (site specific)  
Ability to determine when to notify technician  
Ability to apply basic mechanical skills  
Ability to perform necessary adjustments  
Ability to replace damaged or worn components  
Knowledge of excavator performance characteristics  
Ability to verify maintenance order is completed |
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<td>attachments</td>
<td>C1.2 Evaluates job conditions</td>
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<td>C1.3 Performs digging operations</td>
<td>Knowledge of excavator safety features</td>
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<td>C1.4 Performs lifting procedures</td>
<td>Ability to start, stop, park and shut down equipment following safety procedures and other</td>
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<td>C1.5 Operates various attachments</td>
<td>requirements</td>
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<td>Ability to interpret operators manual</td>
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<td>Ability to operate excavator and attachments efficiently</td>
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<td>Ability to select buckets</td>
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<td>Knowledge of overhead powerline hazards</td>
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<td>Ability to verify minimum safe working clearances</td>
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<td>Knowledge of staking and marking procedures to identify buried services</td>
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<td>Knowledge of site conditions and hazards</td>
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<td>Knowledge of safe operating procedures for close proximity</td>
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<td>Knowledge of utility markers</td>
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<td>Knowledge of X-ray warnings</td>
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<td>Ability to assess terrain conditions</td>
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<td>Ability to work safely and cautiously in hazardous conditions</td>
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<td>Ability to interpret excavation and trenching standards</td>
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<td>Ability to interpret transportation of dangerous goods act</td>
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<td>Ability to interpret municipal by-laws and utility regulations</td>
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<td>Knowledge of confined entry procedures</td>
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<td>Ability to identify confined space requirements for entry</td>
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<td>Knowledge of pipeline right of way markings</td>
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<td>Knowledge of field pipe markings</td>
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<td>Ability to off set pipe seams for welding operations</td>
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<td>Ability to identify a drag section</td>
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<td>Knowledge of bucket techniques</td>
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<td>Ability to apply productivity to cycle time</td>
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<td>Ability to read grade stakes</td>
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<td>Ability to check depth of excavation</td>
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<td>Ability to select and install rigging hardware and slings</td>
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<td>Ability to identify proper pipe lifting hooks</td>
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<td>Ability to secure and lift loads</td>
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<td>Ability to attach tag line</td>
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<td>Ability to operate hydraulic thumb</td>
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<td>Ability to operate vibrator</td>
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<td>Ability to operate ripper shank</td>
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<td>Ability to operate screw anchor</td>
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| C2. Performs clearing operations | C2.1 Stock piles logs  
C2.2 Grubs stumps  
C2.3 Removes rocks | Ability to operate hydraulic hammer  
Ability to use various buckets  
Ability to operate spoon  
Ability to excavate foreign line and pipe crossings (hot lines)  
Knowledge of hazards associated with stock piling logs  
Knowledge of types of trees  
Knowledge of hazards associated with brushing operations  
Ability to sort logs  
Ability to stack logs  
Ability to dig out and pile stumps  
Knowledge of tree burning and containment  
Ability to construct burning piles  
Ability to roll burning piles  
Ability to knock down leaners  
Ability to clear extra work space  
Ability to determine disposal areas  
Ability to determine salvageable and non salvageable materials  
Ability to construct fire breaks  
Knowledge of burying operations  
Ability to dig out rocks  
Ability to work on grade/slopes  
Ability to bury brush piles |
| C3. Cuts grade | C3.1 Strips topsoil  
C3.2 Installs flume pipe  
C3.3 Installs bridge  
C3.4 Builds ramps  
C3.5 Builds erosion control measures  
C3.6 Removes cuts | Knowledge of various soil types  
Ability to strip top soil  
Ability to avoid mixing of top soil and other materials in piles  
Knowledge of flume pipe installation procedures  
Ability to install flume pipe  
Knowledge of bridge installation procedures  
Ability to prepare banks for bridge installation  
Ability to install bridges  
Knowledge of ramp construction  
Ability to build and tamp ramps  
Knowledge of erosion control methods  
Ability to identify specifications for erosion control  
Ability to install filter cloth, straw  
Ability to construct settling ponds  
Ability to set and level rip rap  
Ability to assist other equipment in the removal of cuts  
Ability to remove/install temporary fence lines |
| C4. Digs Ditches | C4.1 Stakes ditch  
C4.2 Sets in blasting mats  
C4.3 Digs rock ditch  
C4.4 Digs ditch  
C4.5 Digs screw anchor location/weight sections | Knowledge of pipeline staking procedures  
Ability to stake ditch for additional work and sidebends  
Ability to determine specifications for slope  
Ability to locate efficient spill sites  
Ability to determine when to have hot lines day lighted by hand  
Ability to dig ditches in various terrain compositions  
Ability to work off of swamp mats  
Ability to operate on a winch line  
Ability to dig sidebend  
Ability to dig overbend  
Ability to dig hotbend  
Ability to dig sag  
Knowledge of start joints and laps  
Ability to dig bell holes  
Ability to dig steps  
Ability to plug out from ditch line  
Ability to construct a work pad  
Knowledge of blasting signals/safe distances  
Ability to recognize unexploded holes  
Ability to set in blasting mats  
Knowledge of constructing wild life crossings and appropriate distances |
| C5. Backfills ditch | C5.1 Fills ditch  
C2.2 Supports hanging pipe  
C5.3 Squeezes water  
C5.4 Sand padding | Ability to install soft plugs  
Ability to rip frost  
Ability to identify ditch specifications  
Ability to identify all cable and foreign pipeline crossings  
Ability to determine the amount of cover to be used  
Ability to construct a uniform roach  
Ability to identify ditch conditions (stability, frost, etc)  
Knowledge of water control in the ditch  
Ability to place swamp weights as required  
Ability to install plugs for water control  
Ability to squeeze water from the ditch  
Knowledge of pipe supporting procedures  
Ability to shade the pipe  
Ability to tamp ditch line  
Ability to sand pad the ditch (pipe in or out of the ditch) |
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<th>Task</th>
<th>Responsibilities</th>
<th>Knowledge and Abilities</th>
</tr>
</thead>
</table>
| C6.  Conducts clean up operations | C6.1 Restores right of way  
C6.2 Removes ramps  
C6.3 Removes flume pipes  
C6.4 Buries debris  
C6.5 Dresses stream banks  
C6.6 Dresses bar ditch  
C6.7 Assists dozer  
C6.8 Loads trucks | Knowledge of environmental requirements  
Ability to evaluate existing contours and replacement of soil  
Ability to determine original lay of land and match slope  
Ability to match virgin soil  
Ability to spread and level top soil  
Ability to rebuilt road crossings  
Ability to rebuild and open drainage ditches  
Ability to rebuild stream/river banks  
Ability to put in water breakers  
Ability to build dikes  
Ability to remove filter cloth/crazy carpet  
Ability to pull brush from tree line  
Ability to pull excess material off hot lines  
Ability to move spill for finishing by dozer  
Ability to bury debris and cover with fill  
Ability to remove ramps  
Ability to remove flume pipe  
Ability to remove rip rap  
Ability to install warning signs  
Ability to determine specifications for bar ditches  
Ability to install fences  
Knowledge of procedures for loading trucks |
| C7  | Assists tie in crew | C7.1 Restores bell holes  
C7.2 Hoists pipe/weights  
C7.3 Positions swamp weights  
C7.4 Hoists pipe at overlap  
C7.5 Installs shoring  
C7.6 Restores road crossings  
C7.7 Excavates hot lines | Ability to determine requirements for bell holes  
Ability to construct steps  
Ability to check balance of load and security of rigging  
Ability to hoist pipe at overlap  
Ability to lower pipe joint on right of way  
Ability to operate on swamp mats  
Ability to attach a winch cable for support as required  
Ability to tramp road sections  
Ability to set concrete pads and marking tape in bar ditch  
Knowledge of shoring requirements for various soil conditions  
Ability to install/remove shoring  
Ability to positions swamp mats  
Ability to work on swamp mats  
Knowledge of hot line trenching procedures  
Ability to dig hot lines |
| C8  | Assists boring crew | C8.1 Digs bore pit  
C8.2 Removes tailings  
C8.3 Performs hoisting operations | Knowledge of boring operations and trenching requirements  
Ability to position boring machine  
Ability to determine extra depth requirements due to boring spill  
Ability to construct various boring trenches  
Ability to cut a key way  
Ability to act as an anchor for the boring machine |
| C9. Assists testing crew | C9.1 Trenching  
C9.2 Hoisting  
C9.3 Operates support equipment | Ability to position boring pipe/augers
Knowledge of equipment used in pipe line testing  
Ability to dig test section  
Ability to dig drips  
Ability to remove hazardous waste from test site location  
Ability to load pigs into launchers  
Ability to install pig catchers/receivers  
Ability to install water lines  
Ability to place suction pumps  
Ability to operate air compressors and pumps  
Knowledge of the hazards associated with the use of methanol |
| C10 Recovers equipment | C10.1 Pulls out equipment  
C10.2 Pulls out own excavator | Knowledge of vehicle/equipment recovery procedures  
Ability to recover pipeline equipment from various terrain conditions  
Ability to skid/position equipment  
Knowledge of towing/repositioning disabled equipment |
| C11. Performs river/creek crossings | C11.1 River trenching  
C11.2 Works on ice/muskeg | Knowledge of methods for working on ice/muskeg  
Ability to source information for changing ice conditions  
Knowledge of alternative methods for working on ice  
Ability to adjust operating procedures/schedules for river crossings  
Knowledge of river break constructions for spoil pile openings  
Knowledge of spoil pile placement on river crossings  
Ability to place swamp mats  
Ability to work off swamp mats  
Knowledge of river crossing procedures  
Knowledge of back fill operations in river crossings  
Ability to backfill ditch line under water  
Knowledge of equipment modifications required to comply with environmental regulations  
Ability to dig waste pits  
Ability to assist sourman  
Ability to assist directional drilling operations  
Ability to install/remove bladders/aqua dam  
Ability to install/remove shoring plates  
Knowledge of procedures to trench slough/swamp |
| C12. Pipeline Maintenance Procedures | C12.1 Excavate main line/valve | Knowledge of dirty water containment  
Knowledge of water filtration  
Knowledge of generator containment pit construction/placement  
Ability to dig generator containment pit  
Knowledge of hot line excavation procedures  
Knowledge of placement of swamp mats for hot digs  
Knowledge of dead line excavation procedures  
Ability to dig a bell hole around an existing pipe  
Ability to excavate with a spoon  
Knowledge of hot tap procedures |