

INFORMATION LETTER

Conventional Oil and Gas Wellsite Reclamation

Background

A research project was undertaken by LAND RESOURCES NETWORK LTD. for the Reclamation Research Technical Advisory Committee (RRTAC) in response to a request from the Alberta Land Conservation and Reclamation Council. Funding for the project came from the Alberta Heritage Savings Trust Fund, Land Reclamation Program.

The objectives of the project were to: define the terms abandoned, suspended and orphan as used by industry and government; estimate numbers of well-site abandonments at present and to be expected over the next 10 years; and, estimate surface reclamation costs.

Definitions

Definitions differ little between the Energy Resources Conservation Board (ERCB), government and industry personnel. The differences which were found relate primarily to the focus of the organizations: the ERCB focuses on the well (down-hole) whereas government focuses on the wellsite (the land surface). Industry is caught in the middle and so uses definitions which straddle the two.

ERCB Definitions

True Orphan Well: a well where the licensee and all working interest owners are defunct or insolvent. If insolvent, a Receiver or Trustee may have been appointed but has subsequently been discharge.

Partial Orphan Well: a well in which one or more of the licensee or

working interest owner(s) are defunct or insolvent but where at least one active licensee or ascertainable active working interest owner remains.

Suspended Well: a well status of "suspended" will appear on the ERCB system and records as soon as the licensee or operator submits an S-4 report and that report is processed by the ERCB. The well could have only been shut-in for a few days at that time. [NOTE: the following definition for a suspended well is solely for the purposes of orphan well levy – any well which recorded twelve consecutive months of nil production or injection in the previous calendar year, excluding abandoned wells, observation wells and domestic wells.]

Abandoned Well: any well (cased or uncased) where porous and permeable hydrocarbon and/or water bearing formations have been effectively isolated through the specified placement of cement caps and where the wellhead has been removed and casing cut-off at a depth of 1 m below ground surface and a steel plate welded across the casing.

Government Definitions

Orphan Well: a wellsite whose licensed operator has ceased to exist, either voluntarily or through bankruptcy, and where no responsible party can be found in the private sector.

Suspended Wellsite: a wellsite that for economic, environmental or other reasons is not viable and all downhole work has met ERCB regulations.

Reclaimed Wellsite: a wellsite

which has been properly abandoned (downhole), and has received a Reclamation Certificate (land surface).

Industry Definitions

Orphan Well: a well that has no readily identifiable owner or party responsible for cleanup.

Suspended Well: a well that still has wellhead equipment present and may or may not have produced in the past. These wells are currently not in production due to economic or environmental reasons, but may produce in the future.

Abandoned Well or Wellsite:
(1) a well where downhole abandonment has been done according to ERCB guidelines and where surface reclamation still needs to be done; or
(2) a completely reclaimed wellsite with downhole abandonment and surface reclamation done and a Reclamation Certificate issued.

A government/industry committee is presently working on a system to allow for the orderly abandonment of orphan wells.

Number of Abandoned And Potentially Abandoned Wellsites

The primary source of information used to estimate numbers of conventional oil and gas wellsites in Alberta was the ERCB general well data file as of March 1992 and the ERCB production history data file as of April 1992. The ERCB general well file was investigated on a bore hold basis to determine the current production status and mode of operation. The

abandoned wells. Over 38% of these wells are located in just four Reclamation Inspector regions, covering the northern half and the south-eastern portions of the province.

According to Land Conservation and Reclamation Council records, 48 264 wellsites have received reclamation certificates; 62% of the abandoned wells. The ERCB database does not show which wellsites have certificates and the government records are not yet computerized, so it was not possible to identify which wellsites are not yet certified.

It was also not possible to determine the reclamation status of those wellsites which did not have certificates. Industry and the ERCB suggested that significant portion of them were fully reclaimed and thus should not be counted as unreclaimed. However, government noted that industry remained responsible for the wellsites until a reclamation certificate was issued.

It proved very difficult to accurately estimate number of wells to be abandoned in the next 10 years. Problems included difficulties in accounting for future abandonments. The study found that southeastern Alberta will likely have the greatest number of abandonments in the next 10 years.

Range of Wellsite Reclamation Costs.

Ranges of reclamation costs were based on results of discussions with nearly 80 government and industry representatives actively involved in the reclamation of wellsites

The cost quoted include surface reclamation for the lease site only, and assume a short access road (0.4 km). Removal of access roads greater than 0.4 km in length can greatly increase the

surface reclamation costs. Access road removal cost estimates range from \$1800 to \$16000/km, depending on the topography, with prices rising as the amount of cut and fill rises. All costs are quoted in 1992 dollars and do not include any downhole work.

For wellsites abandoned after production, surface reclamation costs ranged from \$10 000 to \$14 000 on average in Alberta, with maximum reported costs for a single wellsite in excess of \$100 000. In general, costs are higher in northwestern Alberta, central Alberta, and in the foothills than in southeastern Alberta. These findings agree with earlier studies by the Petroleum Accountants Society of Canada and CPA/IPAC.

Most industry representatives indicated there was little difference in surface reclamation costs between oil and gas wellsites. However, it was noted that there is often less soil contamination when dealing with gas wellsites. Costs associated with reclamation of non-producing wells compared to producing wells were reported only in northwestern Alberta.

Common Reclamation Problems

Gravel removal, compactions, adverse topography, winter conditions during drilling, older wellsites, and loss of topsoil or poor distribution of topsoil were identified as problems in surface reclamation which increased costs.

There appear to be more problems in reclaiming older wellsites, especially those drilled prior to 1978 when there was no requirement for topsoil conservation. Lack of topsoil and organic matter was often cited as a problem.

Various parts of the province have unique reclamation situations to deal with. For example, government and industry representative indicated there were deeper wells and there-

fore larger sump volumes to handle in the northwestern portion of the province. Muskeg sites were also mentioned as being potential problems, particularly in northern Alberta. Accessibility to wellsites could also greatly increase surface reclamation costs (both in hauling costs and in costs of reclaiming long access roads).

In the east-central and southeastern areas, vegetation establishment is difficult because of sandy soils, dry weather conditions, and high erosion potential.

In the foothills, area, topography, rocks, forests and long access roads are all situations that pose problems during reclamation.

Conclusions and Recommendations

- Conservation and reclamation must be taken into account in the planning process for wellsite development and production. Many, if not all, of the "problems" identified above could be avoided with good planning.
- A common set of definitions should be developed which address both the well and the wellsite.
- There is a need to tie the reclamation certificates from the government with the ERCB's well files database. RRTAC will investigate the feasibility of doing this.
- Reclamation status of abandoned wells that do not have reclamation certificates should be investigated by industry and certificates obtained.
- There is a need for better industry estimates of future wellsite abandonments to allow government agencies to plan manpower requirements for the certification process. The quicker these estimates are presented, the better the service to industry.