

REJUVASEAL EVALUATION
CFB COLD LAKE AND CFB WAINWRIGHT

EXECUTIVE SUMMARY

John Emery Geotechnical Engineering Limited, Consulting Engineers (JEGEL), conducted environmental analyses to assess the Sand Rejuvaseal applications completed at CFB Wainwright and CFB Cold Lake. Sand Rejuvaseal consists of Rejuvaseal proprietary coal-tar rejuvenator sealer plus a frictional sand (angular, clean, durable fine aggregate such as fine boiler slag or nonferrous slag). The work was completed at the request of Bill Vandemark of Echelon Industries, Inc.

Evaluations of the Sand Rejuvaseal applications at CFB Wainwright and CFB Cold Lake have been performed by JEGEL and others, including the Department of National Defence. These evaluations include: compositional analyses of Rejuvaseal and sweeper samples supplied to Echelon Industries, Inc. by DND; sweeper dust and snow/sweepings sampling by Jacques Whitford and Associates Limited; and hydrocarbon/PAH analyses of a water sample supplied by DND to Norwest Labs. A work plan was developed by JEGEL and implemented to investigate potential environmental impacts of the Sand Rejuvaseal, and is also described.

The results of the Sand Rejuvaseal evaluations are briefly summarized in the following paragraphs.

Compositional Analyses of Rejuvaseal and Sweeper Samples - Two samples of sweeper dust and a sample of the Rejuvaseal rejuvenator sealer were analysed to determine both organic and inorganic constituents. The analyses consisted of general composition by pyrolysis @ 550°C to determine the proportion of organic and inorganic constituents; volatile organic constituents by gas chromatograph (Rejuvaseal sample only) and non-volatile constituents by infrared spectrometer; and analysis of the inorganic residue for metallic oxides by plasma spectrometer (ICAP Total Oxide Analysis). The analyses indicate that the volatile organic constituents (solvents) consist of a mixture of hydrocarbon fractions containing both aliphatic and aromatic compounds similar in composition to Varsol. The infrared analysis results for the non-volatile organic constituents (resins) of the sealer indicated that the sample consisted of a mixture of

hydrocarbon polymers, mostly aliphatic compounds. The analyses of the non-volatile constituents of the two sweepings samples indicated that the two samples were identical in composition and consisted of a mixture of hydrocarbon polymers containing aromatic and aliphatic rubber-like compounds. It is speculated that the presence of rubber-like compounds may be attributable to rubber build-up from aircraft tires. DND provided a sample of a typical aircraft tire for comparative compositional analysis, but the results of the comparative analysis were not conclusive.

Jacques Whitford Sweeper Dust and Snow/Sweepings Sampling - On February 23/01, samples of the sweeper dust and snow/sweepings were obtained at CFB Cold Lake by Jacques Whitford. A summary report describing this site visit, Rejuvaseal inspection and sampling details has been prepared, and includes photographs of the runway surfaces, snow banks, and the sweeper equipment and equipment maintenance facilities. A total of 6 liquid and 7 solid samples were taken, representing sweeper residue (dust) and melt water from snow banks. Upon receipt at JEGEL, it was determined that the individual snow samples, once melted, did not provide sufficient liquid to permit individual analyses of the organic constituents to be completed. Samples of the snow melt were submitted for inorganic analysis.

Hydrocarbon/PAH Analysis of Water Samples - A sample(s) obtained by DND in the vicinity of Building 85 was submitted to Norwest Labs for analysis of non-halogenated aromatics (BTEX), total purgeable hydrocarbons and total extractable hydrocarbons. The precise nature of the sample is not known and DND has been contacted for additional details. The sample was also analysed for polyaromatic hydrocarbons (PAH). Comparison of the analysis results with the Canadian Council of Environment Ministers (CCME) Water Quality Guidelines for the Protection of Aquatic Life indicated several exceedances of PAH criteria.

JEGEL Field Sampling and Laboratory Testing Program - JEGEL has developed a program of field sampling in order to obtain samples of the sealed pavements at CFB Cold Lake and CFB Wainwright for laboratory evaluation of the RejuvaSeal-treated asphalt concrete surface physical properties in accordance with the application contract requirements, and to obtain additional samples of RejuvaSeal-treated and untreated pavement for environmental testing. The field sampling (coring) work was sub-contracted to Shelby Engineering of Edmonton. The

proposed analyses included bulk analyses of major oxides, determination of volatile and non-volatile organic constituents. In addition, both distilled water and acid leach testing were carried out, both on intact cores and 'crushed' cores, for comparison purposes.

Environmental monitoring of the Rejuvaseal treatments at CFB Cold Lake and CFB Wainwright coordinated by JEGEL, with independent laboratory testing of asphalt concrete cores, sweeping material and asphalt pavement surface runoff (treated areas and untreated control areas) has shown no significant exceedances of applicable environmental criteria (CCME for instance), particularly when treated and untreated areas are compared (some natural mineral constituents and/or operational activities such as de-icing can cause exceedances).