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DESIGN BRIEF

DESIGNED BY MAJM

DATE October 27, 1995

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PROJECT NO. 14950 SHORT TITLE Royal Oak Mines

DESIGN SUBJECT Giant Yellowknife Division; Arsenic Storage REF. DWGS. _____

Available Data Base: I General.

Ref.

- I-1 • Drawing S-94-1 Surface Plan, Arsenic Chamber Locations, April 7, 1994.
- I-2 • Report by Geocon Inc. Mine Backfill Sampling Program, Dec. 11, 1981.
- I-3 • File titled "Mine Data" Arsenic Storage. Memo from M. J. Lye. April 16, 1968.
- I-4 • Memo by M. Mitchell to A. Marshall. "Arsenic Dust Density". Jan. 30, 1985.
- I-5 • Folder titled "Arsenic Bulkheads". Historic data assembled in 1995.
- I-6 • Folder titled "As₂O₃ Bulkheads" Assembled in 1995.
• Folder titled "Arsenic Recovery, PRE-1988". Assembled in 1995.
- I-7 • Memo from W. M. Gilchrist to A. K. Muir titled "Underground Disposal of Arsenic" Nov. 22, 1950. *
- I-8 • Folder titled "Arsenic Storage, Inspection" Assembled in 1995.
- I-9 • Folder titled "Collection + Storage of Arsenic Dust" with drawings. Assembled in 1995.
- I-10 • Folder titled "Area 1, Arsenic Recovery"
- I-11 • Folder titled "Arsenic Storage, Papers & Reports" assembled in 1995.
- I-12 • Folder titled "Arsenic Storage Inspection Reports. Assembled in 1995.
- I-13 • Folder titled "Arsenic Storage - General Location" Assembled in 1995. Has surface Plans and Generalized Cross-Sections.
- I-14 • Folder titled "Composites" Assembled in 1995. Contains drawings (plans, cross-sections, etc) and reports.
- I-15 • Folder titled "1994 Arsenic Inspections and General Info). contains data mainly on Arsenic Chamber No. 12

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Available Data Base. I. General (cont'd).

- I-16 • Folder Untitled. Contains memo by J.D. Bateman to A.K. Muir "Ground Testing For Arsenic Disposal" November 18, 1950. and results of diamond core drilling and temperature measurements.*
- I-17 • Folder Untitled. Contains Drawings and correspondence re temperature measurements in 1970's, and earlier.*
- I-18 • Drawing. Giant Yellowknife Mines Ltd. "Underground Arsenic Storage in Relation to Open Pits".
- I-19 • Drawing. Giant Mine. Surface Geology. 17 August, 1995.

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Ref. Available Data Base: II Individual Storage Chambers

- II-1. Chamber No. 11. Underground Bulkhead Design, 1985-86.
- II-2. Chambers Nos. C2-19; C2-20; C2-21. Folder on Proposal for Underground Arsenic Disposal Chamber, Jan 3/75.
- II-3. #14 and #15 Arsenic Stopes. Folder of memos and drawings assembled in 1995.
- II-4. B 2-08. Arsenic Chamber. (Assembled in folder, 1995) Contains drawings.
- II-5. B2-30; B2-33; B2-34. (Assembled in folder, 1995) Contains drawings and drill hole data.
- II-6. B2-35; B2-36. (Assembled in folder, 1995) Contains drawings.
- II-7. B2-12; B2-13; B2-14. (Assembled in folder, 1995) Contains drawings and reports.
- II-8. B2-08. (Assembled in folder, 1995) Contains drawings.
- II-9. C2-12. (Assembled in folder, 1995) Contains drawings and memo reports.
- II-10. Chamber No. 9. (Assembled in folder, 1995) Drawings and memoranda.
- II-11. Chamber No. 11. (Assembled in folder, 1995) Memo only.
- II-12. Chamber No. 10. (Assembled in folder, 1995) Memos and one drawing.
- II-13. Chamber No. 12. (Assembled in folder, 1995) Report on leak in October, 1990.
- II-14. Chamber No. 12. (Assembled in folder, 1995) Report on grouting of Bulkhead.
- II-15. #12 Arsenic chamber. (Assembled in folder, 1995) Contains drawings, reports and correspondence.
- II-16. #11 Arsenic Chamber (Assembled in folder, 1995) Contains sketches and correspondence.
- II-17. #12 Arsenic chamber (Assembled in folder 1995) Contains drawings, correspondence and reports.
- II-18. Drawing B2-30. Arsenic Storage October 15, 1971.
- II-19. Drawing 2-14 Stope Thru Inspection Slot July 12/65.

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Available Data Base: II Individual Storage Chambers (cont'd)

- II-20 • Drawing B2-30, Arsenic storage 'B' level 250 Oct. 15/71.
- II-21 • Drawing B2-36, Arsenic Storage 'B' level 250 Oct. 19/71
- II-22 • Drawing B2-08, Arsenic Storage 'B' level 250 Nov. 10/71
- II-23 • Drawing B2-35, Arsenic Storage 'B' level 250 Oct. 19/71
- II-24 • Drawing B2-34, Arsenic Storage 'B' level 250 Oct. 18/71
- II-25 • Drawing B2-33, Arsenic Storage 'B' level 250 Oct. 15/71
- II-26 • Drawing Section No. 6 2-12 Stope 'B' level 100-250 July 12/65
- II-27 • Drawing Shaft B, Surface, DDH for No. 11 Arsenic Stope December 31, 1986.
- II-28 • Drawing MA-340, #11 Arsenic Stope, August 20/1986.
- II-29 • Drawing MA-243, #10 Arsenic Chamber, July 7/1984.
- II-30 • Drawing (Un-numbered) C-12 Arsenic Storage
- II-31 • Drawing B2-12/13/14 Arsenic Storage Aug. 15/1968.
- II-32 • Drawing As Chambers #12, #14 & #15, March 4, 1994.
- II-33 • Drawing No. 12 Arsenic Stope. Lower & Upper Bulkhead, General Arrangement, March 22, 1988.
- II-34 • Two large untitled Drawings showing plan and Section details of Arsenic Storage Chambers 11 & 12.
- II-35 • Drawing Plan of Arsenic Stopes B2-12, B2-13 and B2-14 May 8, 1991. Updated Sept, 1988.
- II-36 • Drawing Plan of Arsenic Stopes 2-08/2-30/2-33/2-34/2-35/2-36. May 7/81. Updated Aug 22/88.
- II-37 • Drawing Composite Plan of Arsenic Stopes. C2-12 / #9 / #10.
- II-38 • Drawing C & B. Composite Arsenic Storage in Waste. July 4, 1974.
- II-39 • Drawing Shaft C, Arsenic Storage C#9 (In Waste) Feb. 1/1975

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Outline of Dedicated Factual Report Covering:

- Items 5 and 6 of "Information to be collected"
- Items 2 and 3 of "Sources of Information"
- (Notes by Mr. L. Connell, May 19-20, 1995).

Intent is to consolidate into one report all of the relevant factual information on the existing system of storage chambers.

1.0 INTRODUCTION

- Objectives of this report
- Applicable Regulatory controls and requirements.

2.0 BACKGROUND

- Historical; schedule of implementation, mining activities.
- Basic approach to design, construction, operation, etc.
- Arsenic properties
- Interface with mining operations
- Regulatory Approvals, Inspections, Reporting, etc.
- Published technical / Environmental literature.

3.0 STORAGE CHAMBERS (For each individually)

- Site investigation/s.
- Regulatory Approval
- Design of chamber, bulkheads, etc.
- Construction
- Operational Factors, filling schedule, etc.
- Inspections; Contingency plans.
- Performance (Problems, if any).

4.0 POST-CONSTRUCTION STUDIES

- Geotechnical / Geological
- Inspections/s
- Thermal / Permafrost
- Piezometric
- Interface with mining

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Outline of Dedicated Report (cont'd)

5.0 GENERAL

- Summary of main features
- Outline how data would be utilized in additional reports to meet Regulatory requirements.
- Presently proposed strategy for decommissioning
- Mining activities in near future.

APPENDICES

(To suit Sections 2.0; 3.0 and 4.0 of Report)

DRAWINGS

- overall plan (Perhaps base on Drawing S-94-1 of April 7, 1994)
- Individual Plan Drawings for Four groups of chambers, ie (1) • B2-12; B2-13; B2-14
(2) • B2-08, B2-30; B2-33; B2-34, B2-35, B2-36.
(3) • C2-12, #9, #10
(4) • #11, #12, #14, #15
- For each Chamber, Drawings showing
 - Plan, vertical and horizontal sections
 - Details of access drifts; bulkheads, etc.
 - Investigatory works, eg drill holes, thermisters, etc
 - Remedial work, where involved.

NOTE: The intent is that this report would be the base document for use in generating other required information (eg. 3D Geological model) and other reports.