
SILURIAN METALLOGENY PROJECT
Lawrencetown to Morristown Area
Annapolis and Kings County,
Nova Scotia

NTS 21A14, 21A15
RFP 3 1993-000591

VOLUME I - PROJECT REPORT

OFR 96-010

M. Cullen, P. Webster, B. Hudgins

May, 1996

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VOLUME II GEOLOGICAL MAPS

1:10,000 Scale Project Geology Maps : 3⁰ MTM Projection

✓ Map # 44 8000 - 65100	in pocket
✓ Map # 44 8500 - 65100	in pocket
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✓ Map # 44 9000 - 65000	in pocket
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SILURIAN METALLOGENY PROJECT: Lawrencetown to Morristown Area, Annapolis and Kings County, Nova Scotia

PREFACE

In June 1994 a mapping project was initiated under the Canada-Nova Scotia Cooperative Agreement on Mineral Development (1992-1996) to include all of the Silurian - Devonian stratigraphy in the Nictaux region of western Nova Scotia. The area to be mapped (Fig. 1) included partial coverage of eleven 1:10,000 scale MTM map sheets. In addition, the project proposal called for compilation of all known mineral occurrences as well as an accompanying report.

The contract was awarded to Nictaux Mapping, 6411 Quinpool Road, Halifax, N.S. The consulting company, consisting of Peter Webster, Mike Cullen and Bruce Hudgins, commenced work immediately. The project involved: (1) literature compilation of all existing public geological information, (2) literature compilation of all mineral occurrences and deposits, (3) 1:10,000 scale mapping of Silurian - Devonian stratigraphy between Lawrencetown and Morristown, (4) field checking of all mineral occurrences, (5) collection of samples for subsequent petrographic and geochemical investigations, (6) presentation of preliminary products, including abstracts, at the Branch review of Activities in 1994 & 1995, (7) preparation of a report for the area and (8) submission of all information to the Department in digital format. These digital files will become part of the Department's GIS databank and will become easily accessible in the near future.

This report (*Volume I and II*) represents the final installment of that contract (*RFP# 3 1993-000591*). Funding constraints did not allow for either petrographic or geochemical analyses of samples collected throughout the region. However, a catalogue of collected sample material may allow for such studies in the future.

On behalf of the Department I wish to thank the authors of this report for their diligence in fulfilling contract obligations, meeting all deadlines and providing information in both hard copy and digital formats for easy handling.

Project Co-ordinator

Paul K. Smith

I. INTRODUCTION

This report and its accompanying maps represent the final deliverable components of the Silurian Metallogeny Project as described in RFP 3 1993-000591, dated November, 1993.

The project's main objective has been to enhance the understanding of mineral resource potential within the project area and thereby provide an information base from which both economic and technical benefit might be derived. After discussions with coordinator P. Smith of Nova Scotia Department of Natural Resources (NSDNR), the following project components were agreed upon as deliverables:

1) 1:10,000 Scale Bedrock Mapping - For project purposes, the area to be studied was defined as that shown in Figure 1. A bedrock mapping program was completed throughout this area during the summer and fall of 1994 with minor additional work completed in 1995. Field data for eleven 1:10,000 scale map sheets were coordinated for plotting using FIELDLOG® Version 2.83 software and 3° MTM digital basemap files. Geological interpretations reflecting project results were subsequently generated.

2) Mineral Occurrence Compilation - This effort consisted of researching available public domain information sources to locate mineral occurrences of significance, and compiling such information for field checking, map presentation and inclusion in the NSDNR Mineral Inventory Database. New mineral occurrences discovered during the field program were also appropriately documented. A field component of the compilation study provided basic information pertaining to location and mineralization and also entailed selective collection of samples for subsequent study by NSDNR staff. Acquisition of rock geochemical data from mineral occurrence sampling was not included within the project's contractual terms of reference, but recommendations in this regard have been provided.

3) Reporting - A final report documenting the mapping and compilation programs was specified as a project deliverable, along with preparation of abstracts and visual materials suitable for display during the 1994 and 1995 NSDNR Open House forums.

II. PROJECT SCHEDULING AND METHODS

Compilation activities began in mid June, 1994, after contract signing, and field work was initiated early in July. To facilitate the latter, a base of operations was established in Lawrencetown and maintained for the duration of the summer. Shorter periods of concentrated field work were subsequently completed late in 1994 and in 1995. Map generation efforts and finalisation of the compilation work continued through early 1995, leading to submission of preliminary versions of

all maps to NSDNR by March 31, 1995. Final project deliverables were submitted to NSDNR in May, 1996 in both hard copy and digital formats.

Mapping control was obtained through pace and compass traversing in conjunction with 1:10,000 scale color airphotos and 3° MTM orthophotos. Outcrop location, structure and rock sampling data were co-ordinated through FIELDLOG and appropriate outputs appear in Appendices I and III. Recommendations for geochemical investigation of certain samples have also been included.

III. GEOLOGICAL OVERVIEW

Regional Geology

The project area is underlain by stratified sedimentary sequences ranging from Cambro-Ordovician to Triassic in age. Devonian age plutonic rocks of the South Mountain Batholith are intrusive into the pervasively deformed Lower Paleozoic sequences and generally show well defined contact metamorphic aureoles in adjacent country rocks. Carboniferous age sequences have not been identified within the project area and essentially undeformed Triassic strata unconformably overlie the Lower Paleozoic formations. Figure 2 outlines pertinent formational nomenclature and corresponding lithologic characteristics.

The project area forms an ENE trending, elongate belt predominantly underlain by Lower Paleozoic sequences of the Halifax, White Rock, Kentville and Torbrook Formations along with minor amounts of Triassic age Wolfville Formation. These occur within a relatively open, shallowly east-plunging synclinorium that is evident along a strike length of approximately 50 kilometers.

Slates and thinly interbedded sandy siltstone of the Meguma Group's Halifax Formation comprise the stratigraphically oldest sequence present within the project area, and their Cambro-Ordovician age is broadly accepted (Crosby, 1962; Schenk, 1978)). Silurian age volcanic and sedimentary sequences of the overlying White Rock Formation have previously been described as disconformably to conformably overlying the Halifax Formation and these in turn have been conformably overlain by fine grained grey and black slates and meta siltstones of the Silurian age Kentville Formation (Taylor, 1969; Smitheringale, 1973; Sarkar, 1978). A Devonian age has been assigned to the conformably overlying Torbrook Formation, based upon brachiopod fauna present. This formation is characterized by the presence of a lower section, defined by the common occurrence of bedded quartzitic arenites, a middle section characterized by a broadly calcareous stratigraphy of locally siliceous dark shales, slates and siltstone, and an upper section of interbedded red and grey shales, mudstones and quartzitic arenite. Minor amounts of volcanic material have also been tentatively identified within the lower and middle portion of the formation. Triassic age red bed sequences of the Wolfville Formation unconformably overlie the Lower Paleozoic stratified and plutonic rocks along the northern edge of the project area but are

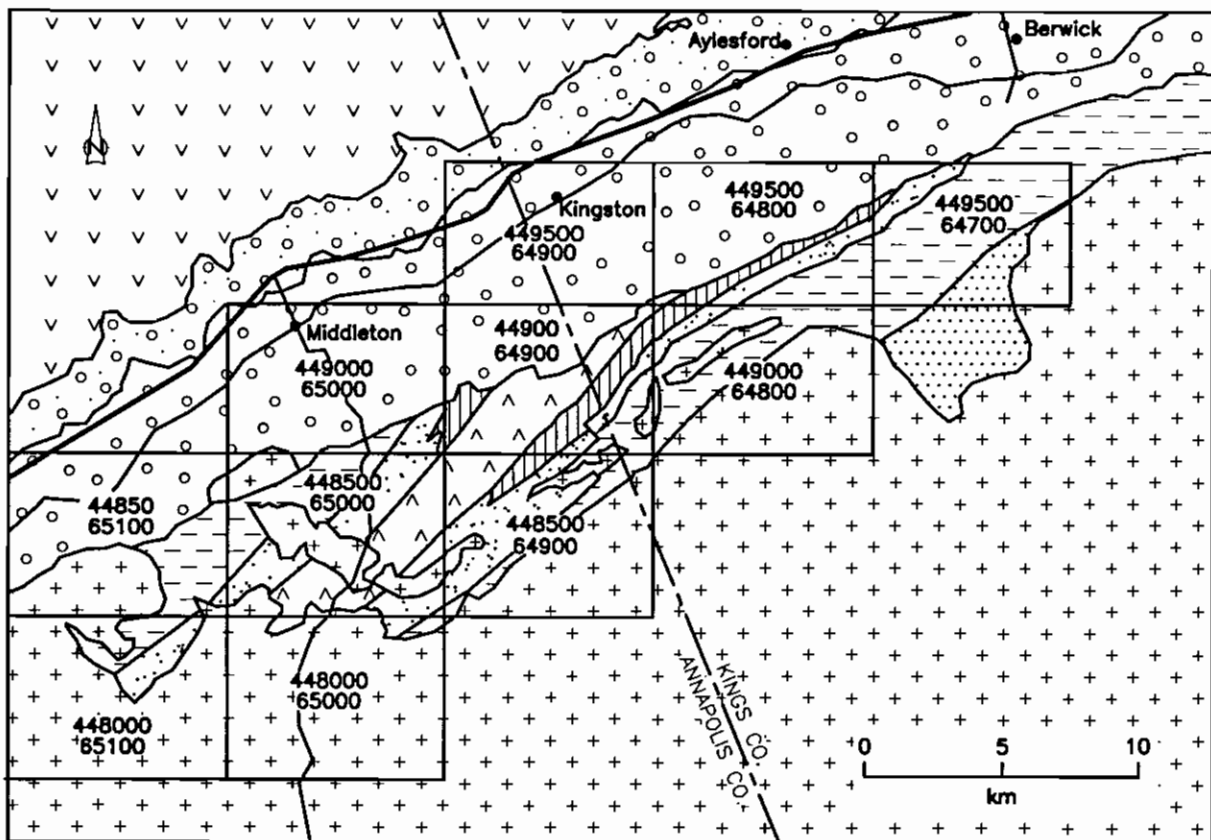
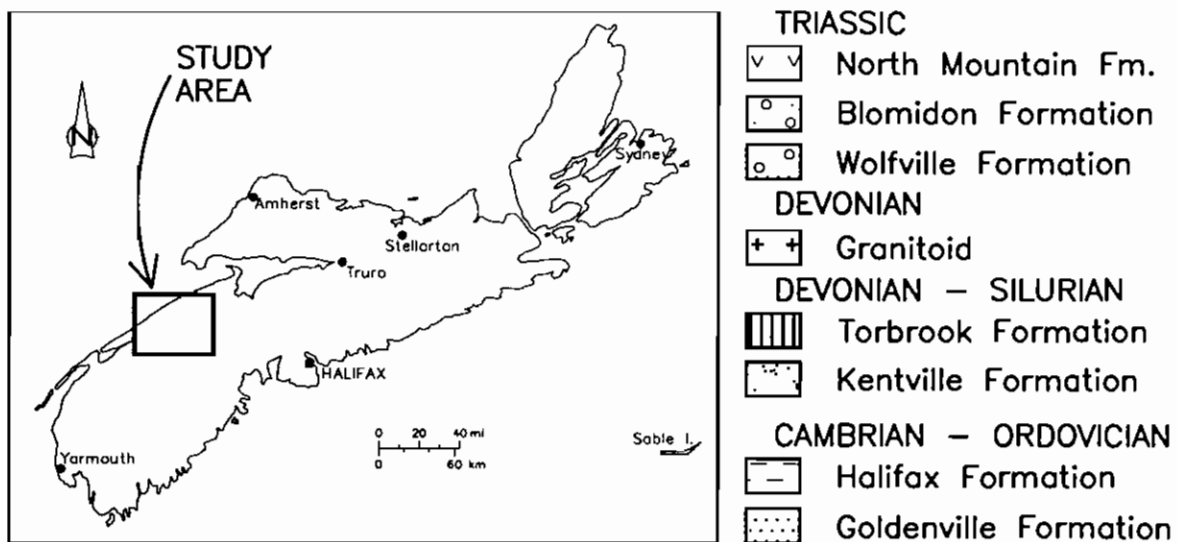


Figure 1: General geology of the project area indicating 1:10,000 scale MTM map coverage.

Figure 2
Stratigraphic Nomenclature

Period	Series	Rock Unit	Rock Subunit	Lithology
TRIASSIC		Wolfville Formation		- sandstone and arkose
DEVONIAN	Upper		DCml	Angular Unconformity Inglisville Leucomonzogranite
	Middle	South Mountain Batholith (DC)	DCmgCL	Cloud Lake Monzogranite
			DCgdSG	Scrag lake Granodiorite
			DCgd	Granodiorite
			M	Gabbro/Diabase: pre and post South Mountain Batholith
	Lower	Torbrook Formation - DT	DTe	- quartzitic wacke, sandy siltstone, shale, locally fossiliferous
			DTd	- siliceous siltstone, heterolithic conglomerate/breccia
			DTc	- quartzitic iron deposits (occur within DTb)
			DTb	- siliceous/calcareous siltstone and limestone, locally fossiliferous
			DTa	- thinly bedded siltstone
SILURIAN		Kentville Formation - SK	SKb	- graptolitic shale and infrequent volcanogenic sediment or tuff
			SKa	- black siltstone, slate, interbedded arenite
		White Rock Formation - OSW	OSWa	- quartz arenite, siliceous siltstone, sandy shale, minor tuff
			OSWb	- quartz arenites, grey shale, laminated siltstone
			OSWc	- mafic volcanics; pillow lavas, flows, breccias tuff and chert
			OSWd	- felsic volcanics; ash flow, crystal tuff, welded tuff, thin flows
			OSWe	- volcanogenic? conglomerate, breccia
			OSWf	- quartz arenite (lateral equivalent of d, e locally)
ORDOVICIAN	Upper			
	Middle			
	Lower	Halifax Formation - COH	COHa	- siltstone, slate with arenaceous laminae
			COHb	- spotted slate to hornfels
COHc			- hornfels with paragneissic banding	
CAMBRIAN	Upper			
	Middle	Goldenville Formation - COG	COG	- quartzite, minor slate

NOTE: Inferred stratigraphic order is oldest to youngest

exposed at only a few locations. No basalt outcrops of the Triassic age Blomidon Formation occur within the project area.

Regional Structure

As noted above, the Lower Paleozoic sequences occur within an ENE trending synclorium that shows shallow easterly plunges. An upright, generally symmetric style of folding characterises the project area although locally significant limb steepening and overturning affects have been documented. These seem particularly evident adjacent to granodiorite and granite intrusions and promontories. A pervasive, axial planar slaty cleavage affects most fine clastic lithologies whereas spaced solution cleavage and incipient fracture cleavage are common in calcareous and quartzitic lithologies, respectively. In many instances, slaty cleavage development in fine clastic lithologies of all formations has effectively obliterated mesoscale primary layering through transposition. A direct result of this has been to distinctly limit definition of intermediate scale folding trends in these lithologic packages.

A post regional folding crenulation and/or kinkband fabric is variably developed throughout the length of the project area. Strength of development, orientation, spacing and rotation sense of this fabric's components change with location along the belt and to some degree these show spatial coordination relative to granite and granodiorite satellite intrusions and batholith boundary trend irregularities.

Regional faulting is locally apparent from mappable offset of geological marker units and shows orientational preference for EW to NW trends. Locally, however, NNE trending breaks are also prevalent. Definition of strike parallel faulting is difficult in the slate rich sequences of the project area, but such movements are locally indicated by the present geological interpretation. It is entirely possible that significantly more faulting of this style has occurred than is represented on the project map sheets.

Plutonism

Devono-Carboniferous age (370 ± 5 Ma; Reynolds et. al., 1981) granodioritic to granitic intrusive rocks of the South Mountain Batholith (SMB) occur near the southern boundary of the project area throughout its length and most were mapped during the period 1984-1989 by NSDNR. MacDonald and Ham (1992a, 1992b) are the primary references in regard to adjoining South Mountain Batholith rocks adjoining the project area. Additionally, several irregularly shaped plutons and smaller intrusive bodies comparable in composition to those of the SMB have been mapped within the project area. Emplacement of these obviously post dated regional folding as well as at least one phase of mafic sill/dike intrusion. A post-granite period of mafic intrusion has also been documented in the project area but cannot be more precisely dated by relative geological relationships.

IV. STRATIGRAPHY OF THE PROJECT AREA

General

Mappable lithologic subunits occur within each of the formations and these have been informally distinguished through alphabetical ordering on the eleven accompanying map sheets. Diagnostic features of each are described below with respect to interpreted chronological sequence. It is important to recognize that while ordering has facilitated production of the current maps, it is significantly qualified by absence in many areas of petrographic and biostratigraphic information. At this time, ambiguity of some formational contact locations is recognized and subsequent detailed study of such problematic areas could significantly change certain contact locations. The following discussions have been prepared to provide better definition of the map units and subunits. Outcrop location and rock sample data are included in Appendices I and III.

Meguma Group - Halifax Formation (EOH)

Halifax Formation strata are present along the south side of the project area from Factorydale to Tremont and further to the west are exposed on both north and south sides of the regional synclinorium, as well as within several stratigraphic “windows “ that correspond with core zones of certain anticlinal minor folds. Thin bedded to laminated, medium grey to tan cleaved siltstone and slate are prevalent and are further characterized by thin lenses (milimeter scale) and discontinuous laminae of fine grained silty arenite. In most instances, contact metamorphic effects of the South Mountain Batholith are apparent in these rocks, resulting in a distinctly hornfelsic outcrop and handspecimen character. White Rock Formation strata show conformity of bedding attitudes with the older Halifax Formation and no evidence of significant disconformity was noted during 1994-95 mapping. On this basis, a conformable stratigraphic progression between the two formations has been interpreted. This is consistent with most past interpretations but some element of local disconformity is indicated by Smitheringale (1973), based upon isolated exposures in the area south of Harmony.

In the area between Factorydale and Tremont hematitic reddening of a strike continuous belt of Halifax Formation strata is apparent. The hematitic area has been identified on the accompanying geological maps but at present it's origin is uncertain. Locally, it would appear that reddening is a primary feature of the finely laminated siltstones but thin section observations by Smitheringale (1973) have been interpreted as supporting a post diagenetic origin. An obvious possibility in this regard is that reddening developed through oxidation of these strata due to proximity to the sub-Wolfville Formation Triassic unconformity.

White Rock Formation (OSW)

The White Rock Formation was originally defined by Crosby (1951) to the east of the current project area and subsequently others have modified its definition to more accurately encompass the characteristics of this sedimentary - volcanic sequence. The reader is directed to Smitheringale, (1973) and particularly Lane (1978) for detailed discussions regarding the formation's definition and to Sarkar (1979) for consideration of volcanic geochemistry. For the purpose of the current project, the formation's base is considered to be marked by the first occurrence of demonstrably volcanic material or laterally equivalent massive quartz arenites above the base of the Halifax Formation. Its upper limit is marked by the abrupt change from massive quartz arenites to an overlying grey siltstone and shale dominated stratigraphy. A slight angular unconformity or disconformity has also been reported as making the basal contact in at least one location (Smitheringale, 1973) but results of the current study indicate that an essentially conformable relationship is prevalent in the project area. No evidence of marked angular unconformity was observed.

The formation has been subdivided into upper and lower members for field mapping purposes with the former comprising a sedimentary-volcanic section comparable to Smitheringale's (1973) stratigraphy below his "double quartzite" unit. A distinctive quartz arenite dominated stratigraphy with intercalated red shale, siltstone and minor tuff comprises the upper member.

Lower Member

(Inferred stratigraphic order of rock units)

Felsic Volcanic Subunit - (OSWd)

Rocks of the OSWd felsic volcanic subunit occur at or near the base of the White Rock Formation and are moderately well exposed at several sections along the project area's length. Those at Fales Brook, Cloud Lake Road and the Nova Scotia Power Inc. (NSPI) canal area are considered most complete.

This subunit is comprised of a basal section of light beige weathering, thin to thickly bedded felsic tuff and ash that bear local evidence of welding. Thin intervals of grain size graded waterlain tuff are also present, with quartz and feldspar phenoclastic material commonly comprising up to 10% of individual depositional units. These felsic pyroclastics are typically calcareous and in many instances show distinct millimeter (mm) scale surface pitting resulting from preferential carbonate dissolution. A bedding parallel grain scale fissility is variably developed within the tuff units and reflects the degree to which welding has occurred. Finely disseminated pyrite is also locally present.

In addition to felsic pyroclastics, this map unit is locally characterised by massive, light tan to orange, rhyolitic or dacitic flows that are typically less than 5 metres (m) in thickness. These are present in the NSPI canal section, on Cloud Lake Road, and on the southern reaches of Black Brook. In each case these have been distinguished by presence of mottled, mm scale flow banding with embedded quartz and feldspar phenocrysts up to 1.5 mm in diameter.

Aside from local presence of possible flow lithologies, the OSWd felsic volcanic unit is lithologically and texturally similar to the Fales Brook section over much of the project area between Harmony and Nictaux River. To the west of this zone exposures are infrequent but a gradual thinning of the unit is indicated. A similar thinning trend is notable to the east of Harmony where the relatively thick (10-15 m) tuff section on Fales Brook is laterally represented by thin multiple ash and tuff units interbedded with fine grained grey and blue grey slates. At least some of these units show grain size grading and evidence of water working and none is greater than 1m in thickness. These thinly interbedded tuffs are best exposed along the upper reaches of the Factorydale headpond on the South Annapolis River and along the first few hundred meters of the river to the southwest. A single thin tuff bed (<1.0 m) occurs 600 m to the north along the stream below the electrical generating station and is considered a fold or fault repetition of the southern sequence.

Discovery of the Factorydale tuffs has established volcanic stratigraphy 9.5 km east of it's previously mapped limit and necessitated relocation of the White Rock Formation basal contact to an area 1.5 km south of that indicated by Taylor (1969), Smitheringale (1973) and Lane (1978). These workers appear to have considered the volcanic section of the White Rock Formation to be absent east of the Fales Brook-Harmony area.

Arenite Sudunit (OSWf)

Between Bloomington and Cloud Lake Road clean quartz arenite unit occurs below, or as a lateral equivalent of the felsic or mafic volcanic subunits. These arenites appear to be localized to the south limb of the regional synclinorium and is limited in extent.

Heterolithic Conglomerate or Breccia Subunit (OSWe)

Between Fales Brook and Factorydale, rocks of the distinctive OSWe subunit were discovered in the approximate strike extension position of the Factorydale OSWd tuffs. At Johnson Road, a minimum thickness of 10 m has been estimated for this unit, which is comprised of subangular to subrounded fragments of dark grey to black siltstone plus mafic and felsic volcanic material and minor amounts of mafic and felsic intrusive rocks. These occur in a sparsely pyritic matrix of dark grey to black, siliceous mudstone. Fragment size is difficult to determine accurately due to poor exposure but an average of 5 - 8 cm is indicated and the largest observed was approximately 15 cm in section. Some volcanic fragments bear evidence of light grey green bleaching and the unit is texturally similar to a 3-5 m thick volcanic breccia mapped on Cloud Lake Road, immediately above the OSWe mafic volcanics. The Johnson Road outcrops occur a few hundred meters north of well exposed Halifax Formation strata and, if correlation with the White Rock Formation is

correct, probably represents an isolated synclinal core or keel of the younger rocks. The possibility also exists that these rocks are equivalent to the Upper Ordovician (Ashgillian) glacial diamictite described by Schenk (1972) further to the west and therefore are non-volcanic in origin.

Mafic Volcanic Subunit (OSWc)

Pillow lavas, flows, breccias and directly associated volcanogenic sediment comprise the OSWc mafic volcanic subunit. Good exposures occur on Fales Brook, Cloud Lake Road, Nictaux River, East Branch of Nictaux River and at the NSPI Canal at Nictaux Falls. The unit's thickness is variable, ranging from an estimated 50 m or more on Fales Brook (after allowance for a gabbro sill) to less than 15 m at Cloud Lake Road. Pillows are generally well formed and in most cases measure less than .35 m in observed thickness. Pillows provide good younging direction indicators and typically show well defined chill margin development. Inter-pillow spaces are filled by aphanitic silica and carbonate which in some instances show primary banding. These also occur as matrix phases to interpillow mafic hyaloclastite material. At Nictaux River, irregular carbonate and silica units are interbedded with the lavas and form discrete, but discontinuous, zones 15 cm or more in thickness. These units are interpreted as primary chemical sedimentary accumulations developed in association with the volcanics. Locally, pillowed mafic units are weakly to moderately calcareous and show mm scale dark green and black chlorite blebs and calcite patches of similar dimension. Pillow breccia material is prevalent in some exposures as well, and, as previously noted, a volcanogenic breccia accumulation several meters in thickness occurs at the Cloud Lake Road section.

The OSWc subunit's lower and upper contacts are generally not exposed, but observations to within a few meters of the contacts indicate very little intercalation with either overlying siltstones or underlying felsic tuffs. Both the upper and lower contacts are considered to be broadly conformable on the basis of coplanarity with adjacent bedded lithologies.

Rocks of the mafic volcanic subunit have not been mapped in outcrop east of Fales Brook but have been interpreted as extending almost 5 km further to the east of that drainage, based upon interpretation of government airborne magnetometer survey results. In a similar manner the subunit has been mapped southwest of Fales Brook to exposures at Cloud Lake Road and then beyond to the Wheelock Brook exposures near South Nictaux. All such areas have been designated on the accompanying maps as being defined through interpretation of airborne results.

Fine to medium grained mafic sills and dikes of gabbroic or diabasic association are commonly present within mafic unit exposures. It is possible that at least some of these are comagmatic with the volcanics, but geochemical data to specifically assess this possibility, have not been assembled to date.

Lower Quartz Arenite Subunit (OSWb)

Stratigraphically above the OSWc mafic volcanic subunit a section consisting of thin to moderately thick bedded quartz arenites and interbedded thin grey-green siltstone and shale is developed. These are followed up section by predominance of grey shale and siltstone over the coarser clastic lithologies and are well exposed on the Fales Brook section 150 m downstream from Rockville Notch Bridge. Lane (1978) studied these strata in detail and identified them as being comprised of three distinct lithofacies. For purposes of this project, distinctly grey green, thinly interbedded quartz arenites, ranging in thickness from 10 cm to 1 m were considered diagnostic of this subunit. Individual beds show fining upwards grainsize trends and are often in sharp contact with interbedded thin mudstone or siltstone units. Arenites show mm scale parallel laminae with less frequent development of various crosslaminae styles. Near the base of this subunit interbedded arenites account for greater than 75% of the rocks present. These become less common upsection, ultimately totalling less than 15%, where thinly interbedded medium to dark grey siltstones predominate. These fine grained lithologies often show mm scale mud/silt laminae or discontinuous silt/sand lenticles. The presence of infrequent hematitic shales, siltstones and arenites near the top of the OSWb section is notable, with good examples apparent on Fales Brook, on the east tributary of Nictaux River near the NSPI dam and on Factorydale Brook, 800 meters north of the Harmony Road.

Upper Member

Massive Quartz Arenite Subunit (OSWa)

Stratigraphically above the upper fine clastic lithologies of the OSWb Subunit, a massively bedded succession of multiple quartz arenites marks the base of the OSWa sequence. These rocks are lithologically equivalent to those of the basal unit of the Smitheringale (1973) Double Quartzite member and to the original "White Rock Quartzite" described by Faribault (1909) in the White Rock area, 80 km to the east. Lane (1978) defined his Upper Member of the White Rock Formation by the presence of two thick, multiple arenite units separated by a succession of thinly interbedded siltstones and mudstones. The arenites are highly recognizable by nature of their white to light pink color, massively bedded to poorly laminated character, and occurrence in coherent multistoried sections of 10 to 15 m true thickness. Subunit OSWa shows variation over the length of the project area, most notably by nature of the stratigraphy separating the upper and lower massive arenite sections.

On Fales Brook the two arenite sections are separated by thinly interbedded shales and siltstones with at least one interval showing distinct outcrop scale grey-black color banding of ribbon-like character. The same interval 15 kilometers to the east near Nicholsville and Factorydale shows

hematitic red shale, immature red sandstone and hematitic volcanogenic sediment/tuff. The volcanogenic sediment has been noted to date only in the Nicholasville area.

To the west of Fales Brook the distinctive section comprised of two multistoried arenite sequences is in most instances lost and the corresponding stratigraphic intervals are characterized by a single section of interbedded arenites showing bed thicknesses of <2m. To the extreme south of the project area, arenite thicknesses also appear to be significantly reduced, and no evidence is seen of the paired arenite stratigraphy typical of Fales Brook. This trend is further emphasized west of Black River by a general westerly thinning of the total White Rock Formation section through the Inglisville area.

The upper contact of the White Rock Formation has been lithostratigraphically defined for the present study, based upon the work of Lane (1978), as the top of the OSWa subunit.

Smitheringale (1973) describes a basaltic flow unit occurring within this stratigraphic interval at Nicholasville but inspection of these mafic rocks at the Nicholasville Mn -Ba showing (Mineral Occurrence # A15-03 of this report) provided no clear evidence for an extrusive origin. The somewhat friable and calcareous character exhibited by this lithology is very similar to that of an amygdaloidal mafic sill occurring at the same stratigraphic position 6 kilometers to the east on the South Annapolis River, and for present purposes, these calcareous mafic units are considered to be both correlative and intrusive.

Kentville Formation (Sk)

Lower Slate Subunit (SKa)

Ami (1900) originally defined the Kentville Formation slate sequence and Crosby (1951) Smitheringale (1960), Taylor (1969) and Smitheringale (1973) have subsequently offered further definition based upon more detailed studies. These modifications have followed from identification of Kentville strata progressively further west from the area originally studied by Ami and collectively reduce the ambiguity of early formation descriptions. For the purposes of this study, the Kentville Formation is considered to comprise a section of interbedded dark grey to black slates and siltstones that are locally graptolitic and conformably overlie the Whiterock Formation and underlie the Torbrook Formation as represented on the Fales Brook. As such, it conforms generally with usage by Taylor (1969), Smitheringale (1973) and Jensen (1979).

For field mapping purposes, medium to dark grey or black slates occurring up section from the highest recognizable White Rock Formation OSWa arenites or down section from the lowest lithologically distinct exposures of the Torbrook Formation's DTa subunit, have been grouped within the Kentville Formation. The Fales Brook section provides a good opportunity to view Kentville Formation lithologies which here include fissile medium grey silty slate, dark grey to

black slate and lesser amounts of these lithologies showing thin silt/sand interbeds or individual fine grained sandy laminae.

The presence of dark black slate near the lower transition to White Rock Formation strata is a relationship that has been observed as far west as the Nictaux Falls area on the north limb of the regional syncline. On the south limb of the regional structure, pyrrhotite bearing dark grey and black slates showing moderate hornfelsing effects have been mapped as lithologically distinct Kentville Formation strata along two ENE trending belts. Less distinctive grey cleaved siltstone and slates stratigraphically above these strata, but below the basal quartzitic lithologies of the Torbrook Formation's Lower Member have been included in the Kentville Formation based upon its previously established definition. This perception of lithologic distinction is apparently at odds with that of Smitheringale (1973) since he considered strata of the Kentville and White Rock Formations to be indistinguishable on a lithologic basis west of the Tremont area. This conclusion may have been drawn from the apparently out of sequence presence of arenaceous White Rock Formation strata in some locations west of Nictaux River. The present interpretation accounts for these occurrences through the presence of either synclinal or anticlinal core zones that provide windows to lower stratigraphy (anticlinal zones) or isolated troughs of higher strata (synclinal structures).

Upper Slate Subunit (SKb)

The Kentville Formation is dominated by the previously described fine grained clastic rocks of the SKa Subunit but at a few locations west of Tremont lithologies of probable volcanic origin have also been identified.

These are typically dark greenish grey to black, fine grained mafic tuffs that occur as isolated, thin (15 cm to 1.5 m) interbeds within the upper stratigraphy of the Kentville Formation. Easily accessible exposures occur on the Varner Road, approximately 350 m north of the Neily Road intersection and along the NSPI canal, within the first 250 meters north of Highway 10. In each instance, fine grained rocks of probably mafic composition occur as thin interbeds within the dark grey to black shale section. The road side exposure shows minor disseminated pyrite (<2%) and appears to be grain side graded. It is important to recognise that the upper contact of the Kentville Formation is transitional with lower strata of the overlying Torbrook Formation. As represented on Spinney Brook, and described in detail by Jensen (1979), the transition from grey slate dominated Kentville Formation to the interbedded arenites and siltstones of the Torbrook Formation occurs over approximately 25 m of section, within which the interbedded arenite component increases to about 70%. For purposes of this study, the first occurrence of clean arenite above the slate dominated Kentville succession was used to locate the upper Kentville Formation contact.

Torbrook Formation (DT)

As defined by Hickox (1958) and subsequently viewed by Taylor (1969), Smitheringale (1973) and Jensen (1976), the Torbrook Formation comprises that section of interbedded arenite, fossiliferous arenite, slate, calcareous siltstone and silty limestone that occurs above the Kentville Formation slates and is unconformably overlain within the project area by Triassic age strata of the Wolfville Formation. The Torbrook Formation is highly fossiliferous at many locations and the reader is directed to Smitheringale (1973), Jensen (1976) and Boucot (1960) for detailed reviews of faunal and biostratigraphic information. In summary, studies of shelly fauna and fossil plant remains have firmly establish a Lower Devonian Age and Rhenish Faunal association for the Torbrook Formation host stratigraphy.

Jensen (1976, 1979) studied the Spinney Brook section in great detail and his descriptions of this segment of Torbrook Formation stratigraphy are currently considered the best available. Preliminary field observations during 1994 were initially referenced to this section and five lithologically defined subunits of the Torbrook Formation were ultimately recognized, not all of which are represented at Spinney Brook.

By way of overview, the stratigraphy from oldest to youngest (subunit DTa to subunit DTe) consists of a grey arenitic section with interbedded siltstone and slate overlain by a calcareous section of thinly interbedded, dark grey, siliceous siltstone, mudstone, limestone and slate. The calcareous section is subsequently overlain by a poorly exposed succession of red hematitic shales and interbedded fine and medium grained arenites that often show grey/red mottling.

Arenite, Siltstone And Slate Subunit (DTa)

The base of the Torbrook Formation is considered to be marked by the first occurrence of grey to tan weathering arenite within the otherwise monotonous medium grey to black slate and shale section of the Kentville Formation's SKb Subunit. These lithologies account for up to 70% of the basal Torbrook Formation section locally, range in thickness from a few centimetres to as much as 2.5 m and often show parallel laminae. High angle cross stratification in the thicker sands was not commonly observed, but climbing ripples and ripple cross laminae are abundant. Intervening shales, mudstones and slates typically show wispy, mm scale lenticular sandy interbeds and evidence of bioturbation such as color mottling, laminae disruption and burrows. Detailed analysis by Jensen (1979) revealed several superimposed coarsening upward cycles within the Spinney Brook portion of the section.

The DTa Subunit occurs throughout the extent of the Torbrook Formation, although relative proportions of the fine and coarse clastic components vary from place to place. Additionally, a general change in color from medium grey in the eastern part of the project area to dark brownish grey in the west is apparent, particularly in regard to thicker arenite units. Smitheringale (1973) attributed this color change to increasing presence of fine grained biotite in these lithologies as a

contact metamorphic effect of South Mountain Batholith emplacement. Most historic iron production from the Torbrook Mines area has come from ferruginous arenites distributed throughout this subunit. These are separately described below and defined as the DTc subunit on accompanying project maps.

Calcareous Siltstone, Arenite, Limestone Subunit (DTb)

Rocks of the DTb Subunit are distinguished by nature of their broadly calcareous character and are frequently exposed from Spinney Brook westerly to Inglisville. Medium to dark grey, thinly interbedded, calcareous and /or siliceous siltstone and fine grained arenite predominate within this subunit. Several thin (.10m to 1.0m) beds of medium grey to black limestone also occur but lateral continuity of individual beds is difficult to document. At the present time, excellent exposures of highly fossiliferous black limestone with .5% to 5% coarse grained pyrite exist at the Annapolis County Construction Waste Landfill site immediately south of Black Brook at Torbrook Mines. On Spinney Brook, thin limestones also occur, accompanied by mm scale phosphatic laminae of discontinuous character. These were described in detail by Jensen (1979) and the presence of calcareous strata and interbedded, thin limestone units have been documented by others as well (Taylor, 1965, Smitheringale, 1973).

The calcareous siltstones and sandy siltstones are well exposed on Nictaux River where they occur in a large scale synclinal closure zone and show well developed solution cleavage and minor folding. In outcrop these rocks display ribbon - like grey to dark grey, cm scale color banding that corresponds to bedding. Discontinuous mm and cm scale interbeds of highly siliceous, cherty siltstone also characterise this subunit, particularly west of the Black Brook section.

Bedded Iron Deposit Subunit (DTc)

Two stratigraphic zones within Subunit DTa contain ferruginous quartzitic arenites, some of which were sporadically exploited as sources of iron between 1825 and 1913. Development was focused in the Torbrook Mines area where the Leckie and Shell beds comprising the northern belt were of interest along with the South Mountain Bed of the south belt. Past prospecting and evaluative surveys near Nictaux Canal and in Inglisville were completed in later years and these confirmed a substantial western strike extension of the iron bearing stratigraphy.

The Leckie and Shell Beds are not currently exposed in the areas of past mining, although waste piles from the operations were examined in 1994 for the purpose of sample collection. In contrast, several Fe bearing beds west of Nictaux River in the "Canal Zone" are currently exposed in exploration trenches and cuts and were sampled in 1994.

As described by Woodman (1909) and Wright (1975) and partly exemplified on the waste dumps, the Shell bed consists of a hematite and magnetite bearing fossiliferous arenite unit that is

generally about 1.5 m in thickness. The presence of locally abundant brachiopod shell debris has given rise to the name. The Leckie Bed is situated between 30 m and 60 m stratigraphically below the Shell Bed in the Torbrook Mines area and is reported to range in thickness from 1.2 m to 5.5 m.

The South Mountain Bed and those previously referenced as occurring west of Nictaux River are situated on the south limb of the regional syncline and occur at essentially the same stratigraphic interval as the Shell and Leckie beds. Conversion of hematite to magnetite within these quartzitic units has been attributed to thermal metamorphic effects of the South Mountain Batholith and is pervasive relative to the northern belt occurrences. It is possible that some repetition of the iron bearing beds has occurred in the Canal Zone and Inglisville areas as a result of their position in the core of the regional syncline. This would explain the greater number of individual beds indicated by geophysics in this area and also explain the extended north - south distance over which these occur.

Thin section observations reported by Wright (1975) indicate that the Fe silicate chamosite is present in the iron beds in addition to hematite and magnetite. Oolitic forms of hematite and chamosite have also been recognised and show overprinting by coarsely crystalline magnetite. Beds that have been the focus of past economic interest typically grade from 40% to 50% iron.

Heterolithic Conglomerate/Breccia Subunit (DTd)

Rocks of the DTd Subunit are very limited in distribution and have been identified in only a few isolated outcrops between Nictaux River and Inglisville. These medium to dark grey weathering exposures show subangular fragments consisting of dark grey to black siliceous mudstone or siltstone and fine grained mafic rock of indeterminate origin. Where observed to date, fragments are typically less than 12cm in section and may be accompanied by trace amounts of very fine grained pyrite. Boulders of siliceous, slightly pyritic breccia that are dominated by bleached mafic fragments were found on a forestry access road west of Albany (Mineral Occurrence A14-25) and at least one of these also contained traces of chalcopyrite.

Red Arenite, Shale And Siltstone Subunit (DTe)

Red to mottled grey, thin bedded arenite and cleaved shale and siltstone occupy the highest stratigraphic levels of the Torbrook Formation exposed in the project area. These are concentrated between Fales Brook and Torbrook Mines as a result of their structural position in the core of the easterly plunging regional synclinorium and are unconformably overlain by Triassic age clastic sedimentary rocks of the Wolfville Formation. Strata exposed at the northern extreme of the Fales Brook section consist of massive to locally cross laminated fossiliferous arenites, typically less than 1 m in thickness, interbedded with thin sandy siltstones and strongly cleaved red shales. Basal intervals of some arenites show high concentrations of brachiopod shell debris and are therefore best described as being locally coquinitic. Similar coquinitic rocks occur

in the most northerly exposures on Spinney Brook and in isolated outcrops north of Torbrook Mines. Subunit DTe lithologies are easily distinguished from those of the unconformably overlying Wolfville Formation due to their moderate to steep dips, generally well developed cleavage in shales, greater degree of induration and common presence of brachiopod debris.

Wolfville Formation (TW)

Reddish brown, fine to medium grained arkose, interbedded pebbly arkose, thin conglomerates and shale characterise the Wolfville Formation within the project area. These strata were encountered at only a few outcrop locations along the northern limit of mapping and consistently show moderate to shallow north dips and north younging directions. An exception to this trend occurs on Delancey Brook, near Middleton, where post Triassic fault displacements have resulted in steepening of dips. All rock types are poorly indurated and friable, resulting in their rapid erosion relative to the more resistant Lower Paleozoic rocks. The Formation was formally defined by Klein (1962) and Taylor (1962), Crosby, (1962) and Smitheringale (1973) provide more detailed descriptions of it's regional character.

Devono-Carboniferous - South Mountain Batholith (DC)

The South Mountain Batholith is a polyphase, granodioritic to granitic intrusive complex that was emplaced approximately 370 million years ago and underlies much of southwestern Nova Scotia (MacDonald et al., 1992). Several phases of the batholith occur within and adjacent to the project area and these have been studied in detail most recently by Nova Scotia Department of Natural Resources (Macdonald and Ham, 1992, 1994). These workers remapped much of the main intrusive complex immediately adjacent to the present project area and also extended nomenclature northward to include a well defined system of satellite plutons hosted by both Cambro Ordovician and Siluro-Devonian sequences. Their nomenclature has been retained for project purposes, and in keeping with the current study's mandate, only cursory mapping was completed within the intrusion areas. Results of 1994-95 field programs have, however, allowed redefinition of intrusive boundary locations in several instances and have also more clearly characterised the spatial distribution of contact metamorphic effects. Smitheringale (1973) specifically addressed petrologic and field aspects of the satellite plutons occurring within the Siluro-Devonian sequence and should be consulted as necessary. The following key petrologic characteristics of South Mountain Batholith intrusions occurring within, or adjacent to project area been summarised from the work of Macdonald and Ham (1992, 1994).

Inglisville Leucomonzogranite (DCImI)

The Inglisville Leucomonzogranite intrusion is comprised of two sub-circular bodies that occur between Inglisville and West Lawrencetown. These measure approximately 2.2 km and 4.0 km in diameter, respectively, and show local variation in contact trends due to the presence of irregular

apophyses. The leucomonzogranite is typically buff, pink or reddish in color with medium grained equigranular texture. Slightly porphyritic zones also occur locally, as do pegmatitic pods and quartz vein arrays. Biotite content is <1% with muscovite at 1-5%. Trace amounts of tourmaline and garnet have also been reported and moderate wallrock alteration (sericite, quartz, albite?, minor hematite) characterises some of the quartz vein zones and surrounding bedrock (eg. Barteaux Brook).

Cloud Lake Monzogranite (DCmgCL)

The Cloud Lake Monzogranite is the largest compositionally defined intrusive body exposed within the project area, being present along the entire southern boundary from Factorydale in the east to Roxbury in the west. Its contact with the host Lower Paleozoic stratified sequences varies in character along this length, being generally parallel to the regional structural grain from near Harmony to Nictaux South, and then crossing the structural grain from this point westward. A discontinuous system of small satellite intrusions occurs at a distance of approximately 1 km to 2 km north of the main contact between Harmony and Williamston but also appears to join the main Cloud Lake Monzogranite body east of Bloomington. These intrusions mimic the relationship shown by the main contact relative to stratified sequence trends.

Emplacement of the Cloud Lake Monzogranite clearly post dated development of regional folding and cleavage development, since the major folds are abruptly truncated by the intrusion and its contact metamorphic halo overprints the regional axial planar cleavage. Macdonald and Ham (1992) identify the satellite intrusion trend as correlative with the Cloud Lake Monzogranite, but the same authors have chosen to separately classify strike continuous rocks on the adjoining map sheet to the east. Field work completed during 1994 indicated that such distinction is not necessary, and project maps therefore represent the entire satellite pluton system as being related to the Cloud Lake Monzogranite.

The monzogranite is light to medium grey, fine to medium grained, and locally shows development of quartz and feldspar megacrysts. Biotite content averages <2% but locally reaches 15% or more and muscovite averages slightly over 1.0%. Trace amounts of cordierite and garnet are frequently present, as are alkali feldspar megacrysts. Country rock xenoliths are common to abundant, depending upon location, and exhibit a very broad range in relative degree of assimilation. A preliminary spatial assessment of these features revealed several areas in which gneissic to migmatitic modification of xenoliths or host sedimentary strata had occurred (eg. powerline exposures NW of Parker Meadow, southern segment of Black Brook, southern portion of Delancey's Brook).

Mafic Sills and Dikes (M)

Mafic intrusive rocks occurring within the project area can be broadly grouped on a textural basis and in some instances on the nature of their observed cross cutting relationships with, South Mountain Batholith related intrusions and regional cleavage. Fine to medium grained gabbroic intrusions, showing local compositional differentiation and equigranular to ophitic textures, comprise the most readily mappable category of mafic intrusions. These range in inferred thickness from <5 m to >150 m and occur as relatively isolated, but strike continuous entities. One of the best exposed examples occurs on Nictaux River approximately 1 km south of the current power station. In this area a texturally and compositionally variable gabbroic unit shows both angular discordance and parallelism with bedding, and is interpreted as crosscutting regional cleavage. In addition to the common equigranular to ophitic range of textures, the section also shows local development of glomeroporphyritic plagioclase-pyroxene in zones 1 cm to 20 cm in section.

On Delancey's Brook, west of Nictaux Falls, a similar gabbroic intrusion is characterised by the presence of both quartz-sulphide vein and stringer development and disseminated Fe-sulphide. Some compositional variation within this intrusion is apparent, with a more massive mafic zone being host to the sulphide, but evidence of peridotitic or dunitic zonation was not noted. A 4 m to 5 m thick granitic dike or sill occurs 20 cm below the gabbro's north contact and carries xenoliths of the metasedimentary host rocks, but does not allow a relative gabbro -granite age determination. In contrast, exposures 400 m north of the NSPI dam on Nictaux River clearly show granitic veins of the Cloud Lake Monzogranite crosscutting texturally and compositionally similar gabbro.

Not all mafic intrusions of this category can be shown with certainty to cross cut the regional cleavage, indicating that they may have been emplaced prior to folding. They are most commonly hosted by strata that are older than Kentville Formation and in some instances (eg. Fales Brook) show direct spatial association with Subunit OSWc mafic volcanics of the White Rock Formation. It is therefore possible that some of these intrusions were comagmatic with White Rock Formation volcanism and represent sill - like subvolcanic conduits. A comparison of geochemical characteristics of the two magmatic suites would be helpful in clarifying this relationship.

A third category of mafic intrusions is characterised by very fine grained dikes and sills that are typically less than 3 m in thickness and show well developed glassy chill margins. In some instances, these are difficult to distinguish from massive dark grey quartz arenites without close inspection. Weakly developed ophitic texture is sometimes present and shows a preference for the central areas of individual intrusions (eg. approximately 170 m down stream from NSPI Nictaux dam). Since most of these are bedding parallel, show ambiguous relationships to regional cleavage, and occur in rocks as young as the Torbrook Formation, it is possible that they are related to Lower Devonian igneous activity that produced the New Canaan Formation volcanics

to the east and their inferred lateral equivalents in the Upper Kentville Formation or Lower Torbrook Formation in the project area.

Due to the current lack of relative age distinction that characterises the mafic intrusions, they have been jointly classified on the accompanying maps.

V. STRUCTURAL GEOLOGY AND METAMORPHISM

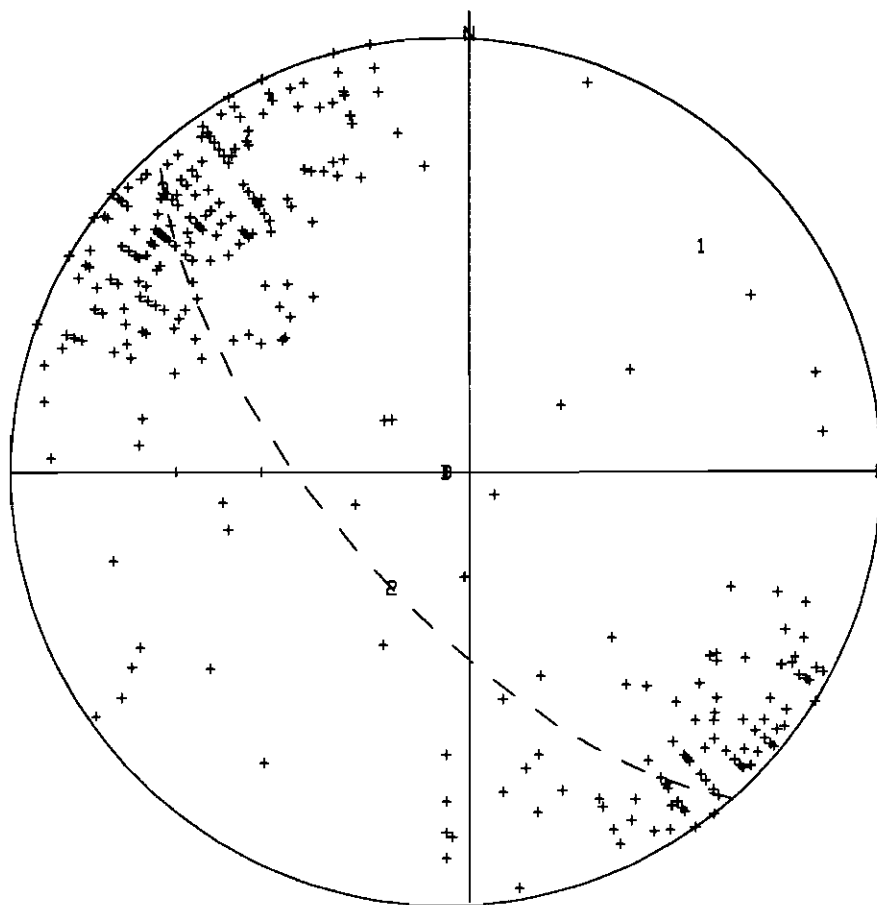
F1 Fold Generation

All pre-Wolfville Formation stratified sequences within the project area have been pervasively affected by one generation of regional folding (F1) that is manifested as a ENE trending, shallowly east plunging synclinorium. This major structure is characterised by a generally upright style with minor fold symmetries reflecting relative location within the larger structure. Above outcrop scale, folding at a wavelength of 500 m to 800 m is apparent within the regional structure which has a wavelength of 8 km to 10 km. Upright regional cleavage (S1) associated with this folding phase is developed as a slaty fabric in fine grained clastic rocks, as a composite solution and fracture cleavage in calcareous sections and as a spaced fracture or incipient grainscale fabric in more massive quartzitic sections. **Figures 3 and 4** present bedding and S1 foliation data and illustrate the orientational relationships that exist between these major structural elements. Minor fold plunges are predominantly to the ENE at less than 35 degrees but local exceptions to this trend have been noted and are believed to have resulted from re-orientation of strata during post folding granite emplacement or shearing (**Figure 5**).

When considered in the context of regional folding, spatial distribution of the various lithological markers allows definition of an enveloping surface trend for the folded sequence. This surface shows relatively flat to gently undulatory dip components that reflect the intermediate scale regional folding pattern and results in repetition of certain stratigraphic intervals at several locations across strike. One effect of this flat lying surface has been to create broader zones of exposure for individual formations than would result from a steeply dipping, consistently younging section. Presence of strongly cleaved to slaty strata within all formations, in which bedding has been largely transposed or obscured, complicates definition of the regional enveloping surface for F1 folding.

F2 Fold Generation

Development of asymmetric kink folds and associated non-penetrative crenulation cleavage (S2) post dated S1, since the earlier fabric clearly shows relative rotation. S2 is predominantly developed in the fine clastic sequences of the Halifax, White Rock, Kentville and Torbrook Formations and has been observed throughout the project area. Discontinuous, cm scale kinkbands and crenulations display both dextral and sinistral rotation senses around moderate to

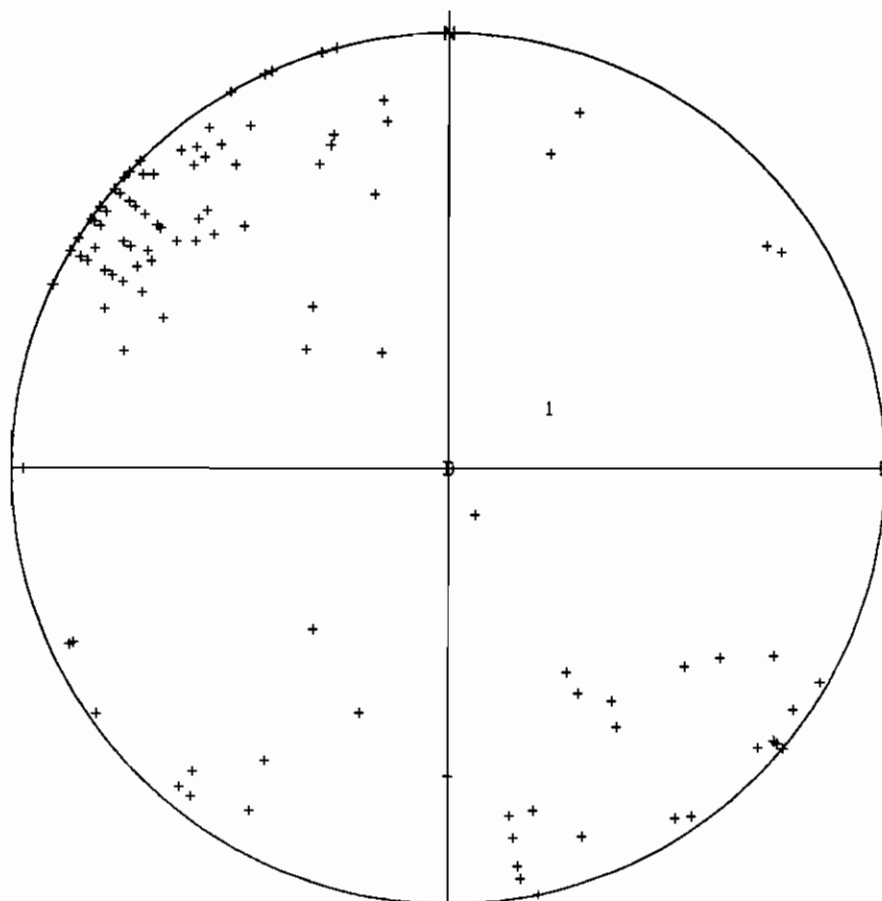


n = 342 Poles to S0 Bedding

Silurian Metallogeny Project

Stereonet Plot
Poles to S0 Bedding

FIGURE 3



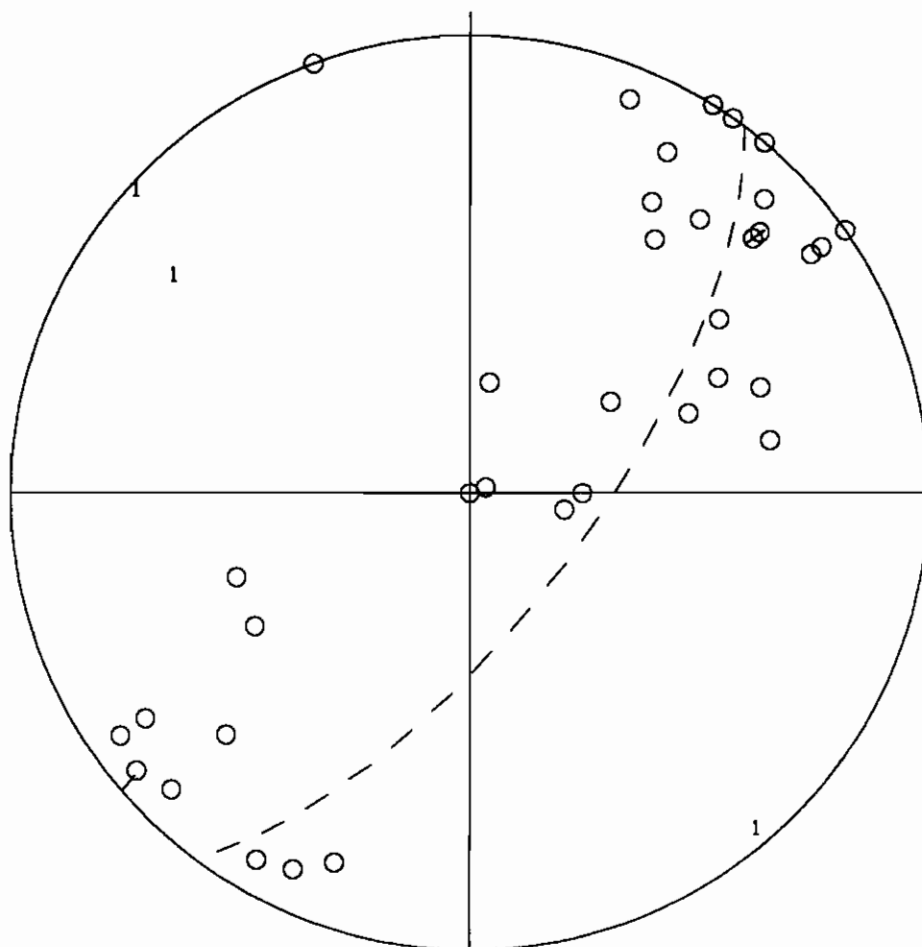
$n = 130$

Poles to S1 Cleavage

Silurian Metallogeny Project

Stereonet Plot
Poles to S1 Cleavage

FIGURE 4



$n = 36$

F1 Fold Axes and Bedding/S1 Intersections

Silurian Metallogeny Project

Stereonet Plot
F1 Linear Elements

FIGURE 5

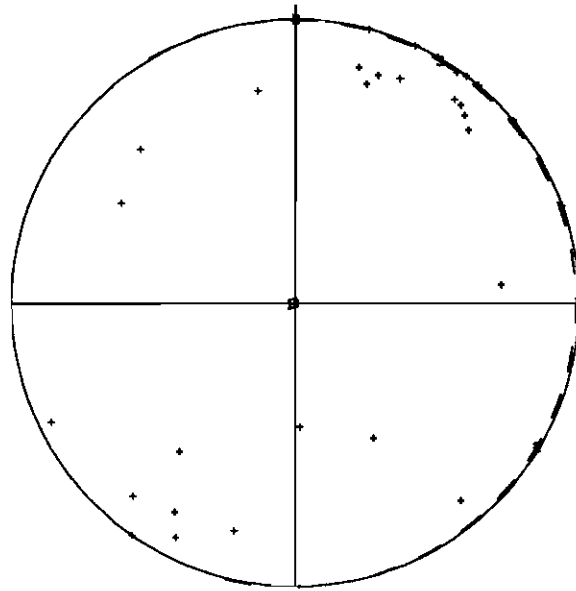
steeply plunging axes. Typically, these define a steeply dipping, NW to NNE striking planar fabric with rotation components showing some spatial zonation relative to several promontories and plutons of the South Mountain Batholith. This may indicate resolution of local shear or shortening components resulting from either emplacement of the intrusions or subsequent regional adjustments. Exposures at Nictaux Falls show contacts of a fine grained, bedding parallel mafic sill to be locally rotated or offset along the crenulation fabric trend, thereby suggesting relative pre-existence of the sill. **Figure 6** illustrates the orientational aspects of the S2 fabric.

Faulting

Faulting of regional scale has been documented in several areas through observed offset of lithologic markers and in some instances zones of bedrock brecciation have been found to coincide with the interpreted fault traces. Historical mining data from the Torbrook district also define fault displacements that would otherwise be difficult to recognise due to poor exposure levels and fault zone parallelism with stratigraphy. Fault trend data from the project area define an orientational preference for NW to N and E to ESE azimuths. In most instances these structures are interpreted as showing moderate to steep dips, based upon field observations and linearity of surface traces.

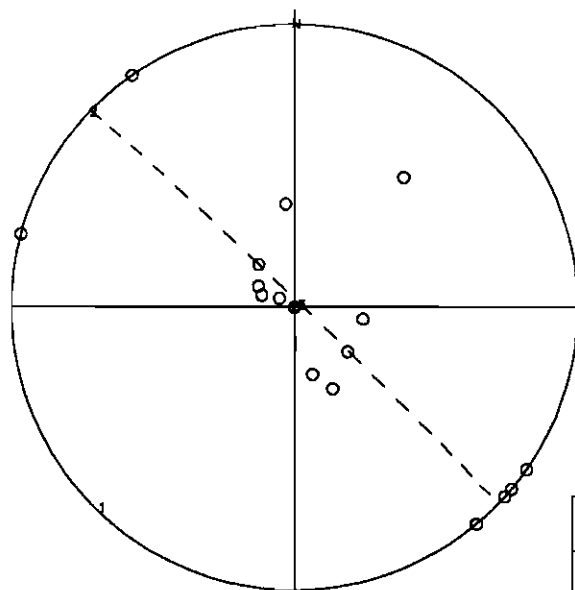
Faults or shears mapped in outcrop generally show evidence of brittle deformation, with discrete zones of shearing, gouge development, brecciation and comminution occurring over widths ranging from less than .5 m to greater than 3 m. Relative concentrations of northerly trending faults occur near Roxbury and in a central corridor between Tremont and Harmony areas. On Wheelock Brook, east of the NSPI Nictaux dam, strongly developed brittle faulting within White Rock Formation strata near the Cloud Lake Intrusion contact is characterised by occurrence of jasperitic and hematitic silica within discrete zones of breccia and shearing. In the Rockville Notch area of the central corridor, brecciated and locally epidote-silica cemented mafic volcanics coincide with the trace of a major N-S trending break that shows apparent sinistral displacement of White Rock Formation strata. This structure is one of several in the central corridor that can be recognised by sequential relative offset of an airborne magnetic signature corresponding to the White Rock Formation OSWc mafic volcanic subunit.

Definition of faults that parallel the regional NE structural grain is difficult due to lack of good stratigraphic markers within much of the section. Additionally, the map patterns of strike parallel faults can often result in strata repetitions that are difficult to distinguish from those resulting from regional folding. In the eastern portion of the project area, on the southwest branch of Annapolis River, a strike parallel fault has been documented in the closure zone of a regional fold and spatial disposition of the thin volcanic tuff units of the White Rock Formation indicate dip displacements along this structure, which is marked by a .20 m to .50 m zone of highly fissile or sheared dark grey to black slate. This association of fold hinge and faulting is similar to that commonly seen within the Meguma Group, where discrete shears have accommodated resolution



$n = 34$

Poles to S2 Crenulation Cleavage and Kink bands



$n = 28$

F2 Crenulation/Kink Axes

Silurian Metallogeny Project

Stereonet Plots
S2/F2 Fabrics

FIGURE 6

of certain folding-related strain components. Morphologically similar shears were noted in black slates of the Kentville Formation south of Nictaux Falls, and also at Fales Brook, where a well developed zone of shearing is 2 m to 3 m in width. In both instances quartz veins and minor amounts of Fe sulphide are associated with the shears.

Timing of fault movements can be partially constrained relative to granite emplacement and regional folding. Evidence for post granite (also post-folding) movement on the NW trending set has already been described but it is more difficult to constrain displacement along the E-W trending structures. In the case of the major E-W fault that displaces the Subunit DTc iron beds in the Torbrook and Nictaux areas, timing is obviously post-folding and configuration of the Cloud Lake Monzogranite contact in the vicinity of the interpreted fault trace may also indicate a post granite emplacement, movement history. In the case of shears that parallel the regional cleavage trend, such as those described in the South Annapolis River and Nictaux Falls areas, timing can only be constrained as contemporaneous with, or post dating, foliation development. Generation of some structures under conditions of brittle-ductile shear is indicated by the association of boundinaged and attenuated quartz veining and local c/s plane development.

Metamorphism

Field observations within the project area allow definition of a low grade regional metamorphic signature that has been overprinted by South Mountain Batholith associated contact metamorphic effects. The regional mineral assemblage is sub greenschist to lower greenschist in grade and characterised by occurrence of chlorite and carbonate in association with S1 foliation. In addition to these commonly occurring phases, quartz plus epidote and possibly albite have also been identified in the mafic volcanic rocks. Contact metamorphic effects of the South Mountain Batholith are spatially zoned and first recognizable through marked induration of pelitic host sequences in company with incipient development of mm scale porphyroblastic biotite and cordierite aggregates. These clearly overprint the S1 regional foliation and produce a characteristic spotted hornfels texture. The limits of contact metamorphic effects, defined on the accompanying geological maps, approximate the surface distribution of this readily identifiable spotted hornfels. Higher grade mineral assemblages have also been recognised, such as areas of garnetiferous biotite quartz paragneiss developed within the Halifax Formation and more restricted occurrences of black, andalusite ?-sillimanite bearing felted hornfels developed from Torbrook and Kentville Formation lithologies. Distribution of paragneissic rocks is restricted to a few contact areas that are also characterised by host rock roof pendant or assimilated xenolith occurrences. One area showing enhanced contact metamorphic effects occurs north of Parker Meadow, in the Nictaux area, and in this instance is associated with a satellite intrusion of the Cloud Lake monzogranite. Raeside et. al.(1994) provide more detailed petrographic and interpretive views in regard to South Mountain Batholith contact metamorphism.

VI. METALLIC MINERAL OCCURRENCE COMPILATION AND SYNTHESIS

General

This aspect of the project consisted of an office compilation phase and a field phase during which designated occurrences were visited. Additionally, several areas of interest outlined during the 1:10,000 scale field mapping program were further documented and incorporated into the project's mineral occurrence inventory. In total, 30 mineral occurrences were defined from the combined programs and several areas of lesser significance were investigated for map notation. Occurrences were initially categorised on the basis of type, mineral assemblage present, geological setting and interpreted age of mineralization. This information was subsequently incorporated with the current geological interpretation for the project area to produce a general metallogenic and mineral potential synthesis.

Metallic Occurrence Classification

The 30 metallic mineral occurrences are summarised in Table I and corresponding descriptions documenting field observations and sampling appear in Appendix II. The occurrences can be further characterized on the basis of interpreted genetic association, thereby defining seven classes or environments of metallogenic significance. These are itemised below;

- 1) **Extensional tectonic environment: potential for volcanogenic base metal sulphides or epithermal gold;** associated with accumulation of Lower Silurian age bimodal volcanic strata of the White Rock Formation and followed by development of a restricted, deeper marine black shale environment of the Kentville Formation;
- 2) **Incipient extensional or transpressional environment: potential for distal volcanogenic or sediment hosted base metal sulphides or epithermal gold;** marked by minor Lower Devonian and possibly Upper Silurian volcanic deposits considered equivalent to the more voluminous New Canaan Formation bimodal volcanic sequence to the east;
- 3) **Stable marine shelf environment: bedded iron deposit potential:** proven by presence of Lower Devonian age ferruginous arenitic and carbonate bearing sequences of the Torbrook Formation;
- 4) **Regional deformation environments: quartz vein hosted and disseminated gold potential:** characterised by folding and faulting of stratified Lower Paleozoic sequences by Mid Devonian Acadian Orogeny;

TABLE I
MINERAL OCCURRENCE CLASSIFICATION

OCCURRENCE NUMBER	STYLE	METAL ASSOCIATION	CLASS	LOCATION
A14-01	Bedded	Fe	3	Callaghan Meadow
A14-03a	Bedded	Fe (Mn)	3	Leckie/Shell Mines
A14-03b	Bedded	Fe	3	Canal Zone
A14-03c	Bedded	Fe	3	Varner Mountain
A14-05	Quartz Vein	(As.Co. Bi. Au)	5,6	Delancey Brook
A14-06	Disseminated	Fe (As, Bi, Co, Ni, Au)	5	Delancey Brook
A14-07	Quartz Vein: Fracture/ Shear	Fe.As. Bi. Co. Ni. Au. U	5,6	Nictaux Dam
A14-22	Quartz Vein Array.	U (Ag)	6	Alpena Road
A14-23	Quartz Vein Array	(As. Bi. Co. Ni. Au. U)	5,6	Wheelock Brook
A14-24	Bedded Breccia. disseminated	Fe.Cu (Zn. Pb. Ag. Ba) (Boulders)	1	Albany
A15-24	Bedded	Fe (Mn)	3	Torbrook
A14-25	Quartz Vein. Shear	Fe (As. Au)	4	Nictaux Rail Cut
A14-26	Quartz Vein Array	(As. Bi. Co. Ni. Au)	5,6	Nictaux Canal
A14-27	Quartz Vein Array	U (Ag)	6	Barteaux Brook

TABLE I
MINERAL OCCURRENCE CLASSIFICATION (Cont'd)

OCCURRENCE NUMBER	STYLE	METAL ASSOCIATION	CLASS	LOCATION
A14-28	Quartz Vein Array	U (Ag, P, F)	6	Bartaux Brook
A14-29	Quartz Vein Array	U (Ag, P, F)	6	Bartaux Brook
A14-30	Greisen, Disseminated	Fe (Sn, W, Mo, Bi, As, Au)	6	Bartaux Lake Road
A14-31	Vein and Fracture Filling	U, Ag, P, F	6	Inglisville Church: Crisp Road
A14-32	Vein and Fracture Filling	U, P, (Ag)	6	Quartzite Zone: Crispe Road
A14-34	Greisen	Mo, As, Bi, Au, U		
A14-33	Quartz vein, shear	Fe, Cu, Zn, (As, Bi, Co, Ni, Au)	5.6	Nictaux River
A15-03	Vein	Mn, Fe, Ba	5	Nicholsville
A15-12	Disseminated	Fe (Au)	4.6	Morristown
A15-13	Vein	Mn, Ba, Ca	5	Factorydale
A15-14	Vein, shear	Fe (Au, As)	4	Factorydale
A15-15	Disseminated	Fe, (Cu, Zn, Au)	6.2?	Bloomington Road East
A15-16	Disseminated	Fe (Zn, Pb, Cu)	2, 1?	Torbrook Landfill
A15-17	Bedded	Fe (Mn)	1	Torbrook East
A15-18	Bedded	P (Mn)	1	Spinney Brook
A15-19	Bedded	Fe (Mn)	1	Torbrook South
A15-20	Greisen	(Sn, W, Mo, As, Bi, Au)	6	Crocker Road
A15-21	Greisen	(Sn, W, Mo, As, Bi, Au)	6	Crocker Road

- 5) **Mid Devonian age or younger mafic intrusive environment;** associated quartz vein style Au, Co, As potential: proven by presence of two sulphide bearing quartz vein occurrences known to date;
- 6) **Mid Devonian age igneous, hydrothermal and contact metamorphic environments of South Mountain Batholith and hosts: polymetallic greisen, vein Mn-Fe and U-Ag potential:** proven by presence of East Kemptville Sn Zn Cu Ag deposit, New Ross Mn deposit and Millet Brook U-Ag deposit in adjacent areas as well as local showings.

Summary Of Indicated Mineral Potential

Metallic Minerals

Volcanic associated base metal deposit potential is first exemplified within the project area by the extensional environment of White Rock Formation volcanism (Sarkar, 1979) and by possibly similar extensional conditions that resulted in accumulation of the very restricted upper Kentville Formation - Lower Torbrook Formation volcanics. Unfortunately, interpreted shallow water to emergent depositional aspects of White Rock Formation volcanism in the project area negatively impact this potential, as does the very limited volume of volcanic stratigraphy. Volcanics associated with the Kentville and Torbrook Formations are similarly constrained, but deeper water depositional environments characterising this period may provide some opportunity for distally developed, sediment hosted massive sulphide accumulations. In this case, structurally focused hydrothermal systems could have produced sulphide accumulations within predominantly reduced, fine grained clastic sedimentary sections. Several areas of pyritic dark grey to black shale and fine grained sandstones occur within this target stratigraphic interval and may therefore represent horizons of enhanced base metal potential.

Epithermal vein gold potential may exist in association with structures that focused the felsic volcanic eruptives noted above and also within potentially associated exhalative sinters of the partially terrestrial felsic sequence. Evidence of these settings has not been identified to date, but carbonatised pyritic felsic tuff locally present within the White Rock Formation may be indicative of favourable environments. Once again, however, restricted development of the volcanic pile is a negative factor.

Syn-sedimentary processes of iron concentration were prevalent during at least a portion of Lower Torbrook Formation time. This resulted in deposition of the past-mined bedded iron deposits in the Torbrook area and those prospected to the south and west. Such accumulations of iron are relatively common in the Silurian sections of the Northern Appalachians and probably mark periods of high iron transport due to weathering and dramatically lower iron solubilities in the shelf environments, possibly due to Eh contrast. Hematite and magnetite are the prevalent iron minerals in these deposits, with magnetite interpreted as being secondary after hematite in

response to thermal metamorphic effects of the South Mountain Batholith's emplacement. It is probable that ferruginous zones additional to those currently known are present, but no economic incentive currently exists for their definition.

Mid Devonian age penetrative deformation of the Lower Paleozoic stratified sequences marks the Acadian Orogenic event and resulted in development of the upright regional folding and associated S1 foliation. As demonstrated elsewhere in Nova Scotia, this folding episode broadly corresponded with, or slightly pre-dated the regional metamorphic culmination and included development of bedding parallel and discordant styles of auriferous quartz veining (Kontak and Smith, 1988). No such auriferous occurrences are known at present in the project area, but several sites of veining have been identified for further attention. In at least two instances, one being on South Annapolis River and the other in a railway cut near Nictaux Falls, evidence of past sampling and exploration of the veins is apparent. Potential for further vein discoveries is present as is potential for discovery of the more attractive disseminated style of gold mineralization exemplified by the Touquoy Deposit at Moose River. Sulphide bearing hydrothermally altered siltstones and slates within the contact aureole of the South Mountain Batholith may represent target areas for this style of mineralization.

An unusual member of this occurrence category is that of pyritic quartz veining hosted by the hematitic bedded iron deposits exploited at Torbrook Mines. Pyritic quartz vein material was recovered from the mine dumps during a 1995 inspection and earlier prospecting of dump material by Shell Canada Resources Ltd. staff revealed local sulphidization within certain magnetite bearing samples (Dickie and Jensen, 1980). It is possible that sulphidic quartz veining hosted by epigenetically sulphidized iron beds could be auriferous and therefore worthy of further consideration. At present, no further information exists in regard to these veins.

The South Mountain Batholith was emplaced at 370 ± 5 Ma and post dated regional folding and associated foliation development within the project area. A well developed contact metamorphic aureole was developed during intrusion and is particularly well represented in pelitic host rocks of the Halifax Formation. Polymetallic greisen mineralization (Sn, W, Mo, As, Cu, Pb, Zn, F, Au, Ag), as exemplified by the East Kemptville deposit, is associated with batholith emplacement and to date is represented in the project area by boulder occurrences of quartz muscovite pyrite ($\pm$ tourmaline) greisen in the Barteaux Lake Road and Johnson Road areas and several areas of weakly to moderately altered sulphide bearing monzogranite. The best exposed of these occurs 400 m downstream from the NSPI Nictaux Dam, where altered sulphidic monzogranite occurs as well as sulphide bearing granite and quartz veins that intrude a mafic sill and carry chalcopyrite traces. Well developed zones of altered monzogranite, biotite hematization and quartz vein flooding also characterise the mid and lower sections of Barteaux Brook where anomalous levels of radioactivity have been locally reported (Dickie and Jensen, 1981).

Presence of the South Mountain Batholith U-Ag association is well documented through drilling and trenching results from investigations concentrated near Inglisville Church-Crisp Road by Shell Canada Resources Ltd. (Dickie and Jensen, 1981). In a manner similar to that described by Chatterjee (1982) for the Millet Brook U-Ag deposit, drilling at the Inglisville Church prospect has shown that hematitic, sauritic and clay alteration accompany fracture controlled

pitchblende, autunite, torbernite and sulphosalts in leucomonzogranite near a moderately dipping host rock contact and indicate a complex system of mineralization. In the surrounding Inglisville area leucomonzogranite, hornfels and White Rock Formation quartzite are hosts to similar discontinuous, fracture controlled mineralization. Opportunities to define new occurrences of economic significance are excellent in the project area, but due to the continued moratorium on uranium exploration and development in Nova Scotia, further evaluation of these cannot be undertaken. Exploration work completed to the time of the moratorium had outlined several areas of further U-Ag potential but most of these have not been designated as mineral occurrences in this report. This reflects the difficulty in re-establishing control on actual showings without field use of radiometric instrumentation. In several instances where evidence of blasting was obviously coincident with a reported showing location, appropriate final map notations have been included.

Quartz veining hosted by mafic intrusions occurs throughout the project area and in several instances sulphide assemblages are also present. For purposes of classification, these have been commonly grouped, based only upon the host lithology. It is apparent, however, that the role of individual intrusions in the mineralizing process may vary from passive to active, suggesting that such classification is overly simplistic. Age of the mafic intrusions showing vein style mineralization is sometimes difficult to ascertain, and as previously noted two or more periods of emplacement are indicated. In several instances mineralization can be clearly constrained as post dating regional cleavage development, and in at least three cases granite veins associated with the sulphidic quartz veins suggest their contemporaneity with South Mountain Batholith magmatism. In such cases the mafic bodies may have acted solely as competent, passive hosts with South Mountain Batholith hydrothermal influences being largely responsible for the sulphidic quartz vein assemblages. In other examples, such as the Nicholsville Mn-Ba occurrence and the Factorydale Mn occurrence, no direct granitic influence can be postulated.

O'Reilly (1991) suggested that a quartz vein hosted Ni, Co, Bi, Sb, Pb, Ag, Au association could be genetically linked to mafic magmatism in southwestern Nova Scotia but a general lack of trace element data for the various occurrences in the project area limits applicability of this designation at present.

Industrial minerals, building stone and aggregate

Distinct from the metallic mineral associations assessment process, industrial mineral potential was also summarily evaluated during the field surveys. Although fracture density and xenolith presence limit quarrying opportunities to some degree, an abundance of new opportunities for granodiorite quarrying are apparent, these being particularly focused in the smaller bodies satellite intrusions of the Cloud Lake Monzogranite. The relatively large mafic intrusions extending from the Nictaux area southwest toward Lawrencetown also provide interesting targets for dimension or monument stone evaluation.

Presence of bedded limestones within the Torbrook Formation indicates potential for use in agricultural applications but restricted unit thicknesses and presence of associated pyrite locally

may limit such opportunities. New sources of high quality bedrock aggregate could be developed from bedded arenaceous rocks prevalent at several stratigraphic levels in the project area. White Rock Formation arenitic rocks that occur immediately above the volcanic section would be well suited to this purpose, as would the thickly bedded arenites in the upper stratigraphy that give the formation its name. Somewhat similar arenaceous strata with very little interbedded shale or siltstone also characterises the lower portion of the Torbrook Formation stratigraphy and could also be considered for high grade aggregate purposes.

VII. CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

The Silurian Metallogeny Project incorporated 1:10,000 scale bedrock geological mapping within a project area extending from Morristown, in Kings county, to West Inghisville, in Annapolis County. In total, approximately 200 km² were covered during the course of field work and interpreted results have been presented on the eleven 1:10,000 scale map sheets that accompany this report. These were developed through integrated use of FIELDLOG Ver. 2.38 mapping software and 3° MTM projection digital basemaps. Digital databases of all outcrop location, sample location, lithologic and structural data were also created and specific outputs from these have been appended.

During the course of field investigations, known mineral occurrences within the project area were visited and basic documentation was compiled for these as well as for all new occurrences encountered. A total of 30 occurrences were assessed and standardized descriptive entries for each have been appended.

Results of the geological mapping program broadly conform to previous regional interpretations but lithologically based subdivisions were established for mapping purposes in all but the Halifax Formation and the Wolfville Formation. Strike extension of the Kentville Formation strata significantly to the west of the area designated by Smitheringale (1973) is a notable change from past regional interpretations, as is documentation of White Rock Formation felsic tuffs 9.5 km east of their previously indicated limit.

Map patterns of the various formations and their subunits describe a gently eastward plunging synclinorium of upright to slightly north vergent folds showing generally symmetric geometries. A shallowly dipping to undulating enveloping surface characterises this folding phase and has the effect of creating isolated windows and outliers of the various formations, locally creating apparent stratigraphic complexity through occurrence of out of sequence lithologic markers. These conditions have been interpreted near the eastern limit of the project area, as well as in the west, and in part may be accentuated by strike parallel normal or reverse faulting.

Assessment of the project area's metallogenic development was approached through initial classification of mineral occurrences into six categories on the basis of mineralogy, style and host sequence character. These were further considered with regard to relative timing of mineralization, stratigraphic development, deformation and granite emplacement. The following six environments of potential metallogenic significance were thusly defined:

- 1) **Extensional tectonic environment: potential for volcanogenic base metal sulphides or epithermal gold;** associated with accumulation of Lower Silurian age bimodal volcanic strata of the White Rock Formation and followed by development of a restricted, deeper marine black shale environment of the Kentville Formation;
- 2) **Incipient extensional or transpresional environment: potential for distal volcanogenic or sediment hosted base metal sulphides or epithermal gold;** marked by minor Lower Devonian and Upper Silurian volcanic deposits considered in part equivalent to the more voluminous New Canaan Formation bimodal volcanic sequence to the east;
- 3) **Stable marine shelf environment: bedded iron deposit potential:** proven by presence of Lower Devonian age ferruginous arenitic and carbonate bearing sequences of the Torbrook Formation;
- 4) **Regional deformation environments: quartz vein hosted and disseminated gold potential:** characterised by folding and faulting of stratified Lower Paleozoic sequences by Mid Devonian Acadian Orogeny;
- 5) **Mid Devonian age or younger mafic intrusive environment;** associated quartz vein style Au, Co, As potential: proven by presence of two sulphide bearing quartz vein systems but genetic link not proven to date;
- 6) **Mid Devonian age igneous, hydrothermal and contact metamorphic environments of South Mountain Batholith and hosts: polymetallic greisen, vein Mn-Fe and U-Ag potential:** proven by presence of East Kemptville Sn Zn Cu Ag deposit, New Ross Mn deposit and Millet Brook U-Ag deposit in adjacent areas as well as local showings.

Additional to the metallic mineral issues addressed above, several areas of prominent potential in regard to dimension and monument stone have been identified. These include granodiorite settings similar to those historically developed in the area and also previously undeveloped mafic settings. Additionally, opportunities for further assessment of agricultural limestone sources in the Torbrook Formation have been suggested in addition to several stratigraphic targets for high grade aggregate.

RECOMMENDATIONS

Work completed to date has provided a basic information set pertaining to mineral occurrences hosted by Ordovician to Devonian age rocks of the project area. As a result of this work several avenues of further study have become apparent and are itemised below. It is recommended that these be pursued as time and resources permit with particular emphasis placed upon early return of analytical results.

- 1) Multi-element analytical work on 24 samples specified in Table II should be completed to better define metallogenic associations and mineral potential.
- 2) A study of fossil assemblages present at the various locations identified on the geological maps should be completed. This reflects a need to update understanding of biostratigraphic issues and to further assess lithostratigraphic correlations suggested in this report.
- 3) Petrographic and major element studies of the newly discovered volcanic tuff and dacitic intrusive? units in the Morristown-Factorydale area would be useful to further define White Rock Formation volcanic section attributes.
- 4) Further study of the heterolithic conglomerate or breccia unit mapped in the Johnson Road to Cloud Lake Road area is recommended. Petrographic work should determine whether correlation with the White Rock Formation volcanic association is appropriate. A possible alternative is that these rocks are correlative with the Ashgillian diamictite unit described by Schenk (1972).

TABLE II

1994-1995 SAMPLES RECOMMENDED FOR GEOCHEMICAL ANALYSIS

SAMPLE NUMBER	MTM NORTH	MTM EAST	NTS SHEET	MTM SHEET	ANALYTICAL GROUP RECOMMENDATION	SUMMARY DESCRIPTION
A14MPC0012	5449344	4966122	21A14	448000-65100	A	- greisenized pyritic hornfels
A14MPC0052	5458154	4968786	21A14	448500-65000	C	- 12 cm quartz vein; 5-15% pyrite , arsenopyrite
A14MPC0117-1	5458655	4968476	21A14	448500-65000	C	- 12 cm quartz vein
A14MPC0139	5456146	4968143	21A14	448500-65000	B	- cherty mafic volcanic with 2-5% pyrite
A14MPC0141-1	5456620	4968512	21A14	448500-65000	B	- chert and cherty siltstone
A14MPC0206-1	5455782	4973145	21A14	448500-65000	D	- mafic sill with up to 10% pyrite
A14MPC0207-1	5455782	4973202	21A14	448500-65000	C	- quartz vein sample with < 15% pyrite, aspy?: 12cm thick
A14MPC0207-2	5455782	4973202	21A14	448500-65000	C,D	- gabbro with irregular quartz stringers
A14MPC0207-3	5455782	4973202	21A14	448500-65000	D	- gabbro with 2-5% pyrite and pyrrhotite
A14MPC0247-1	5454403	4970415	21A14	448500-65000	B	- highly fissile, rusty black slate
A14PCW0275-4	5453554	4969418	21A14	448500-65000	B	- cherty, mafic volcanic? breccia
A15MPC0038	5464544	4976137	21A15	449000-64900	B	- grey carbonate; trace pyrite and calcite stringers
A15MPC0047-2	5464327	4976484	21A15	449000-64900	B	- light grey bioturbated silty sandstone
A15MPC0056-4	5458183	4968270	21A15	448500-65000	C, B	- quartz veining with massive pyrite; 25cm zone
A15MPC0074	5461756	4973603	21A15	449000-64900	B	- black ostracod/crinoid bearing limestone
A15MPC0091	5464699	4972013	21A15	448500-64900	C,B	- mafic, trace chalcopyrite; 5cm pyrite vein

TABLE II (con't)

1994-1995 SAMPLES RECOMMENDED FOR GEOCHEMICAL ANALYSIS

SAMPLE NUMBER	MTM NORTH	MTM EAST	NTS SHEET	MTM SHEET	ANALYTICAL GROUP RECOMMENDATION	SUMMARY DESCRIPTION
A15MPC0121-1	5461249	4972190	21A15	448500-64900	B	- fossiliferous shale with brachiopods; 2% pyrite locally
A15MPC0121-2	5461249	4972190	21A15	448500-64900	B	- dark grey pyritic sandstone; pyrite to 5%
A15MPC0169	5461843	4971656	21A15	448500-64900	B	- black pyritic hornfels with sillimanite?, 2-5% pyrite
A15MPC0212	5477182	4982227	21A15	449500-64700	C	- quartz vein from sheared slate; 40 cm zone
A15PCW0022	5469034	4978991	21A15	449500-64800	B	- cherty mafic breccia; 5-10% pyrite
A15PCW0028	5471434	4978339	21A15	449500-64800	A	- quartz muscovite greisen boulder; pyrite to 5%
A15PCW0033	5472995	4980103	21A15	449500-64800	A	- quartz muscovite greisen boulder 5-15% pyrite
A15PCW0055	5473345	4981841	21A15	449500-64800	C	- red quartz arenite with 40% quartz stockwork

KEY TO ANALYTICAL GROUPS RECOMMENDED ABOVE:

A - Mo, W, Sn, As, Be, Bi, Cu, Zn, Ag

B - Zn, Cu, Pb, Ag, Au, Ba, Mn

C - Au, Ag, As, Bi, Co, Ni, Sb, Pb

D - Ni, Cu, Co

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APPENDIX I

SAMPLE LOCATIONS AND DESCRIPTIONS

STATION	MTM	MTM	NTS	MTM	SAMPLE
NUMBER	EASTING	NORTHING	SHEET	SHEET	DESCRIPTION
A14MPC0012	5449344	4966122	21A14	448000-65100	- fine grained, equigranular, biotite, plag., quartz hornfels? minor dissem. pyrite
A14MPC0028	5458044	4972083	21A14	448500-65000	- fine grained, chloritized mafic with trace pyrite
A14MPC0052	5458154	4968706	21A14	448500-65000	- 12 cm quartz vein with 15% fine grained pyrite and arsenopyrite locally
A14MPC0035	5457546	4969053	21A14	448500-65000	- light grey, megacrystic, quartz biotite granite
A14MPC0074	5458859	4970707	21A14	448500-65000	- dark brown-purple, fine grained, hornfelsed sediment
A14MPC0075	5458977	4970818	21A14	448500-65000	- light cream, finely laminated cherty carbonate
A14MPC0079	5459156	4971051	21A14	448500-65000	- red, fine grained, fossiliferous, silty arenite; brachiopod rich
A14MPC0081	5459014	4971536	21A14	448500-65000	- black, indurated siltstone with trace pyrite
A14MPC0085	5458743	4972265	21A14	448500-65000	- spotted slate/siltstone, discrete euhedral andalusite or cordierite ?
A14MPC0090	5458665	4973435	21A14	448500-65000	- fine grained tuffaceous dacite with white/cream feldspar phenoclasts
A14MPC0093	5458194	4974121	21A14	449000-65000	- dark grey, finely laminated siltstone
A14MPC0095	5458261	4974020	21A14	449000-65000	- very thinly laminated, dark grey to black sandy siltstone
A14MPC0097	5458380	4973665	21A14	449000-65000	- dark greenish grey, fine grained calcareous mafic volcanic
A14MPC0099-1	5458391	4973501	21A14	449000-65000	- fine grained, cream colored quartzite
A14MPC0099-2	5458391	4973501	21A14	449000-65000	- fine to medium grained, dark green gabbro
A14MPC0099-3	5458391	4973501	21A14	449000-65000	- very fine grained spotted cherty siltstone

STATION NUMBER	MTM EASTING	MTM NORTHING	NTS SHEET	MTM SHEET	SAMPLE DESCRIPTION
A14MPC0117-1	5458655	4968476	21A14	448500-65000	- non sulphide bearing, 12 cm thick quartz vein from old prospect pit
A14MPC0117-2	5458655	4968476	21A14	448500-65000	- fine grained, intermediate intrusive/arkosic sediment ?
A14MPC0123	5458887	4968223	21A14	448500-65000	- interbedded, grey brown, hematitic, quartz arenite
A14MPC0124	5458909	4968208	21A14	448500-65000	- hematitic, mottled red, fine grained silty arenite
A14MPC0126	5458938	4968099	21A14	448500-65000	- massively bedded, fine grained, hematitic quartz arenite
A14MPC0127	5458951	4968072	21A14	448500-65000	- dark red polyolithic fault breccia with grey/red sandstone/ siltstone fragments
A14MPC0130	5459020	4967835	21A14	448000-65000	- finely banded, light pink to cream, felsic volcanic; welded tuff or flow
A14MPC0139	5456146	4968143	21A14	448500-65000	- dark grey green, laminated, cherty mafic volcanic with 2-5% pyrite, pyrrhotite
A14MPC0141-1	5456620	4968512	21A14	448500-65000	- grey to cream chert and cherty siltstone
A14MPC0141-2	5456625	4968503	21A14	448500-65000	- very light grey lenses of calcareous chert from siliceous siltstone section
A14MPC0162	5448795	4969342	21A14	448500-65100	- fine grained, light pink, ,equigranular granite
A14MPC0166	5448583	4969743	21A14	448500-65100	- granite with light green felsic alteration and quartz veining
A14MPC0172	5452186	4971518	21A14	448500-65100	- fine grained, grey quartz wacke, abundant fine grained muscovite to 15%
A14MPC0175	5452311	4971487	21A14	448500-65100	- fine grained, massive chloritic mafic
A14MPC0189	5455883	4971789	21A14	448500-65000	- thinly layered, quartz biotite feldspar, migmatite or paragneiss

STATION NUMBER	MTM EASTING	MTM NORTHING	NTS SHEET	MTM SHEET	SAMPLE DESCRIPTION
A14MPC0196	5455840	4972446	21A14	448500-65000	- fine to medium grained, dark green grey diabase
A14MPC0200	5455777	4972778	21A14	448500-65000	- interbedded, thinly laminated and cross laminated silty arenite and siltstone
A14MPC0206-1	5455782	4973145	21A14	448500-65000	- fine grained mafic sill with up to 10% pyrite
A14MPC0206-2	5455782	4973145	21A14	448500-65000	- fine grained, light pink, biotite muscovite granite sill
A14MPC0207-1	5455782	4973202	21A14	448500-65000	- composite quartz vein sample with < 15% pyrite, aspy?: 12 cm thick vein from 3m prospect adit
A14MPC0207-2	5455782	4973202	21A14	448500-65000	- rusty weathered fine grained gabbro with irregular quartz stringers
A14MPC0207-3	5455782	4973202	21A14	448500-65000	- rusty weathered gabbro from pit area zone 1.5m-2.5m wide zone with 2-5% pyrite and pyrrhotite
A14MPC0217	5455409	4973812	21A14	449000-65000	- red, weathered, bedded, micaceous, hematitic arkose
A14MPC0220	5456161	4971059	21A14	448500-65000	- light grey, medium grained, biotite rich granodiorite
A14MPC0223	5456288	4970647	21A14	448500-65000	- coarse grained, light grey, quartz, biotite, rich granodiorite
A14MPC0228	5456651	4969618	21A14	448500-65000	- fine grained, highly silicified siltstone or volcanic
A14MPC0229	5456317	4969394	21A14	448500-65000	- highly indurated, dark grey slate/siltstone
A14MPC0230	5455004	4969738	21A14	448500-65000	- dark, fine grained, quartz fragmental unit, 20% fine grained sandy matrix
A14MPC0232	5455308	4969810	21A14	448500-65000	- very fine grained mafic, possibly pillowed volcanic
A14MPC0235	5455547	4969940	21A14	448500-65000	- light green grey, aphanitic chert

STATION	MTM	MTM	NTS	MTM	SAMPLE
NUMBER	EASTING	NORTHING	SHEET	SHEET	DESCRIPTION
A14MPC0240	5455565	4970535	21A14	448500-65000	- fine grained granodiorite with 15-20% biotite, 20% quartz, 10% feldspar
A14MPC0241	5455614	4970555	21A14	448500-65000	- light grey Kspar rich megacrystic granite
A14MPC0247-1	5454403	4970415	21A14	448500-65000	-highly fissile, rusty black slate
A14MPC0247-2	5454403	4970415	21A14	448500-65000	- light grey, fine grained, bleached silty wacke
A14PCW0191	5458196	4973666	21A14	449000-65000	- very fine grained, black slate; strong cleavage
A14PCW0259	5457718	4973457	21A14	448500-65000	- fine grained hornfels with sillimanite needles
A14PCW0269	5454935	4968737	21A14	448500-65000	- fine grained quartz arenite with siliceous, hydrothermal alteration
A14PCW0270	5454677	4968927	21A14	448500-65000	- coarse grained gabbro, aphanitic chill margin; with quartz stringers, trace pyrite
A14PCW0275-1	5453634	4969277	21A14	448500-65000	- silver grey, fine grained slate or cleaved volcanigenic sediment ?
A14PCW0275-2	5453554	4969418	21A14	448500-65000	- pyritic, fine grained rusty brown slate; 5% pyrite locally
A14PCW0275-3	5453554	4969418	21A14	448500-65000	- massive dark green to black sediment/mafic volcanic?
A14PCW0275-4	5453554	4969418	21A14	448500-65000	- light green breccia, cherty, chloritic, cherty fragments; mafic volcanic?
A14PCW0275-5	5453554	4969418	21A14	448500-65000	- dark green, massive mafic volcanic
A14PCW0277	5457940	4971957	21A14	448500-65000	- fine to medium grained, grey green mafic
A14PCW0280	5457938	4972333	21A14	448500-65000	- medium grey green, spotted siltstone

STATION	MTM	MTM	NTS	MTM	SAMPLE
NUMBER	EASTING	NORTHING	SHEET	SHEET	DESCRIPTION
A14PCW0285	5457681	4972901	21A14	448500-65000	- dark green pillowed mafic with carbonate selvage
A14PCW0294	5459021	4971904	21A14	448500-65000	- very fine grained black slate with 10 cm semi-massive magnetite layer
A14PCW0295 1	5460250	4973644	21A14	449000-65000	- very fine grained, fissile shale/siltstone with quartz carbonate stockwork
A14PCW0295-2	5460250	4973644	21A14	449000-65000	- 12cm quartz vein with 2-5% pyrite
A15MPC0008	5469390	4978880	21A15	449000-64800	- thinly laminated siltstone/shale with fine grained biotite
A15MPC0009	5469461	4978860	21A15	449000-64800	- folded, dark grey slate with thin calcareous laminae
A15MPC0011	5469057	4979065	21A15	449500-64800	- fine grained, grey vesicular pillow basalt
A15MPC0020	5468530	4979263	21A15	449500-64800	- light green, fine grained, felsic dike with trace pyrite
A15MPC0023-1	5468456	4979882	21A15	449500-64800	- interbedded, fine grained red siltstone/sandstone
A15MPC0023-2	5468407	4979900	21A15	449500-64900	- fine grained, red arenite with abundant brachiopod fossils
A15MPC0026	5468670	4978736	21A15	449000-64800	- mottled grey/red fine grained silty sandstone
A15MPC0030	5464810	4975808	21A15	449000-64900	- dark purple, hematitic, chlorite basaltic ash or flow
A15MPC0033	5464718	4975863	21A15	449000-64900	- purple to green hematitic, chlorite, volcanic ash/tuff
A15MPC0038	5464544	4976137	21A15	449000-64900	- fine grained, grey carbonate with trace pyrite and calcite stringers
A15MPC0039	5464463	4976201	21A15	449000-64900	- fine to medium grained, polymictic conglomerate
A15MPC0047-1	5464327	4976484	21A15	449000-64900	- fine grained, flaggy, grey and purple/red sandstone

STATION	MTM	MTM	NTS	MTM	SAMPLE
NUMBER	EASTING	NORTHING	SHEET	SHEET	DESCRIPTION
A15MPC0047-2	5464327	4976484	21A15	449000-64900	- light grey bioturbated silty sandstone
A15MPC0056-1	5458199	4968304	21A14	448500-65000	- coarse grained saussuritized granite with minor sulphides
A15MPC0056-2	5458789	4968296	21A14	448500-65000	- altered granite dike with 2-10% disseminated pyrite
A15MPC0056-3	5458183	4968285	21A14	448500-65000	- coarse grained biotite gabbro
A15MPC0056-4	5458183	4968270	21A14	448500-65000	- associated footwall quartz veining with massive pyrite; 25cm zone
A15MPC0067	5458741	4969561	21A14	448500-65000	- fine grained, equigranular, biotite, quartz, monzonite
A15MPC0073	5458792	4970637	21A14	448500-65000	- thinly laminated, nodular, siliceous, light grey argillite
A15MPC0074	5461756	4973603	21A15	449000-64900	- black ostracod/crinoid bearing calcareous limestone
A15MPC0078	5462134	4972591	21A15	448500-64900	- bleached and cleaved, chloritic fine grained sediment/volcanics ?
A15MPC0080	5462437	4971829	21A15	448500-64900	- dark green pitted/weathered gabbro
A15MPC0084	5465221	4974158	21A15	449000-64900	- rusty weathered, thinly bedded hornfels/paragneiss
A15MPC0085	5465280	4974032	21A15	449000-64900	- light cream to grey weathered monzogranite
A15MPC0088-1	5464753	4972580	21A15	448500-64900	- light cream, fine grained, orthoquartzite
A15MPC0088-2	5464753	4972623	21A15	448500-64900	- polyolithic volcanic breccia with chert, plus felsic and mafic volcanic clasts
A15MPC0088-3	5464811	4972555	21A15	448500-64900	- bedded rhyolitic crystal-lithic tuff
A15MPC0091	5464699	4972013	21A15	448500-64900	- fine grained mafic, trace chalcopyrite; 35cm boulder with .5cm pyrite vein
A15MPC0093	5464615	4971552	21A15	448500-64900	- thinly bedded, indurated, siliceous, hornfelsic quartzite
A15MPC0104	5469485	4978537	21A15	449000-64800	- fine grained, silty sandstone, hematitic, biotite porphyroblasts
A15MPC0106	5469525	4978449	21A15	449000-64800	- fine grained diabase sill

STATION NUMBER	MTM EASTING	MTM NORTHING	NTS SHEET	MTM SHEET	SAMPLE DESCRIPTION
A15MPC0112	5469747	4978166	21A15	449000-64800	- thinly banded, biotite, quartz gneiss
A15MPC0117	5461347	4971848	21A15	448500-64900	- thinly bedded, indurated silty, fine grained wacke, locally hornfelsic
A15MPC0121-1	5461249	4972190	21A15	448500-64900	- very fine grained, dark grey, fossiliferous shale with brachiopods; 2% pyrite locally
A15MPC0121-2	5461249	4972190	21A15	448500-64900	- fine grained, dark grey pyritic sandstone; pyrite to 5%
A15MPC0134	5461110	4974080	21A15	449000-64900	- dark grey, highly fissile, slate/siltstone
A15MPC0136	5461154	4971024	21A15	448500-64900	- banded, dark grey brown, quartz, biotite paragneiss
A15MPC0140	5461295	4970794	21A15	448500-64900	- k-feldspar, porphyritic, quartz, feldspar, biotite monzogranite
A15MPC0151-1	5461770	4970108	21A15	448500-64900	-mottled, cream/grey flow banded dacite
A15MPC0151-2	5461770	4970108	21A15	448500-64900	- massive, fine grained, grey dacite
A15MPC0153	5461716	4969850	21A15	448500-64900	- boulder; fine grained, light grey, quartz arenite
A15MPC0155	5461672	4969566	21A15	448500-64900	- light grey, feldspar, quartz crystal tuff
A15MPC0167	5462467	4971258	21A15	448500-64900	- dark grey, k-feldspar, porphyritic granodiorite
A15MPC0168	5461667	4971539	21A15	448500-64900	- hornfelsic, dark grey, calcareous shale or mafic tuff; 10% pyrite locally
A15MPC0169	5461843	4971656	21A15	448500-64900	- black pyritic hornfels with accicular sillimanite?, 2-5% pyrite
A15MPC0173	5477663	4983224	21A15	449500-64700	- hematitic, fine grained, light grey mafics with 5% chlorite spots

STATION NUMBER	MTM EASTING	MTM NORTHING	NTS SHEET	MTM SHEET	SAMPLE DESCRIPTION
A15MPC0174	5477669	4983235	21A15	449500-64700	- fine grained, massive, grey, calcareous, mafic dike
A15MPC0175-1	5477672	4983267	21A15	449500-64700	- quartz calcite/ rodocrosite vein; locally 50% rhodacrosite; tension gashes to 20 cm
A15MPC0175-2	5477672	4983267	21A15	449500-64700	- carbonatized mafic dike
A15MPC0179	5477643	4983434	21A15	449500-64700	- fine grained, medium grey, felsic tuff -ash
A15MPC0184	5477609	4983643	21A15	449500-64700	- grey green, micaceous slate /cleaved siltstone
A15MPC0189	5477420	4983791	21A15	449500-64700	- hematitic red/grey cleaved siltstone/slate
A15MPC0191	5477103	4984104	21A15	449500-64700	- massively bedded, light grey to cream quartz arenite
A15MPC0192	5477028	4984060	21A15	449500-64700	- medium grained, weathered, diabasic gabbro
A15MPC0195	5476793	4983962	21A15	449500-64700	- friable, red micaceous siltstone/ mudstone
A15MPC0196	5476784	4984038	21A15	449500-64700	- light grey, fine grained, sandy siltstone
A15MPC0205	5477763	4982697	21A15	449500-64700	- medium grey green slate with quartzitic laminae
A15MPC0206	5477653	4982434	21A15	449500-64700	- light greenish grey, fine grained felsic tuff
A15MPC0208	5477435	4982377	21A15	449500-64700	- fine grained, light green, welded tuff with 40% altered cream feldspar
A15MPC0210	5477296	4982296	21A15	449500-64700	- fine grained, volcanic unit with lapilli size fragments
A15MPC0212	5477182	4982227	21A15	449500-64700	- white quartz vein sample from sheared dark grey blue slate; 40 cm zone

STATION NUMBER	MTM EASTING	MTM NORTHING	NTS SHEET	MTM SHEET	SAMPLE DESCRIPTION
					chip sample
A15MPC0214	5477135	4982150	21A15	449500-64700	- medium grey blue, siltstone/slate
A15MPC0215	5477282	4981991	21A15	449500-64700	- massive, chloritized, locally calcareous dacite
A15MPC0216	5477331	4981940	21A15	449500-64700	- chloritic dacite or mafic; weak fabric
A15MPC0221	5478408	4981359	21a15	449500-64700	- fine grained, quartzitic arenite with 2-5% pyrite
A15PCW0022	5469034	497899	21A15	449500-64800	- cherty mafic breccia and sediment with 5-10% pyrite
A15PCW0024	5471539	4978807	21A15	449500-64800	- poly lithic volcanogenic? breccia or conglomerate; siltstone, ash, mafic, fragments to 12cm x 8cm in
A15PCW0028	5471434	4978339	21A15	449500-64800	- fine grained, grey blue, quartz muscovite greisen boulder ; 40cm x 25cm; very fine grained pyrite to 5% and minor light brown tourmaline
A15PCW0029	5471445	4978338	21A15	449500-64800	- monzonitic to granitic auto breccia with massive chlorite matrix locally; possible siliceous sediment fragments; 1m x .7m boulder
A15PCW0033	5472995	4980103	21A15	449500-64800	- quartz muscovite greisen boulder 5-15% pyrite; 35cm x 20 cm
A15PCW0055	5473345	4981841	21A15	449500-64800	- fine grained, red quartz arenite with 40% chaotic ,white quartz stockwork veining; no sulphides; approx. 50m west of Mn showing at Nicholsville
A15PCW0056	5473460	4981790	21A15	449500-64800	- fine grained, grey green to hemititic red, altered tuff ?

APPENDIX II
MINERAL OCCURRENCE DESCRIPTIONS

NOTE: Elements in parentheses have not been documented to date but potential for their occurrence is indicated

METALLIC MINERAL OCCURRENCE DATABASE

Occurrence Number: A14-03
Occurrence Name: Collectively as Torbrook Hematite-Magnetite Beds
Elements (Potential): Fe, (Mn)

Location: Various locations noted as A14-03(a), (b) (c) etc. on 21A14 and 21A15 sheets in the Torbrook to Inglisville area of Annapolis County; see project maps

County: Annapolis

MTM: 448500 65000, 449000 65000

Easting: various

Northing: various

NTS: 21A/14

Sample Numbers: A14PCW 295-1, 2; A14PCW 294

Description: Ferruginous arenite and coquinite of the Torbrook Formation contain hematite and magnetite after hematite within the lower stratigraphy of the Torbrook Formation in this area. Anomalous manganese levels have also been reported from these iron rich strata according to Taylor (1969) . The beds have been distinguished as a map unit for current purposes and their distribution and characteristics are addressed in Section IV of this report. Wright (1975) provides a useful review of the area's mining history, that spanned the period 1825 to 1916, and various shaft and trench locations are available from that source. Several of these have been posted on project maps.

Summarily, underground production from the steeply dipping Shell and Leckie beds, which ranged in thickness from 1.8m to 5m or more, was centered in the Martin, Wheelock and Leckie shaft areas at Torbrook Mines and waste rock piles from these operations now mark their locations. The Shell bed were traced by surface trenching for at least four kilometers to the northeast and is documented on adjoining 21A15 mapsheet as Mineral Occurrence A1517 of this report. To the southwest, repetitions of the ferruginous stratigraphic interval occur in the closure zone of the regional synclorium, and have been investigated most aggressively at the Canal Zone (Wright, 1975) where geophysical, trenching and drilling programs were completed by Torbrook Iron Mines Limited in 1956 and 1957 (Stonehouse, 1957,58). Magnetite is the predominant iron phase present in this area and is considered a result of contact metamorphic effects of the South Mountain Batholith on the originally hematitic beds. The Canal Zone area had been extensively prospected in the past, as evidenced by numerous trenches and cuts that expose the magnetite rich strata. The same interests also completed investigations of favourable stratigraphy along the south limb of the regional synclorium, with focus placed upon the previously known South Mountain Bed, which was found to be of inferior quality. Several other occurrences were discovered within the westerly strike extension of the fold closure zone between Nictaux River and Inglisville. Subsequent exploration was undertaken in the area by Shell Canada Resources Ltd. , between 1978 and 1981, with emphasis on evaluation of U and polymetallic greisen potential. This work served to further define the westerly extension of the magnetite rich units.

All iron occurrences of the style noted above were grouped by Nova Scotia Department of Mines within the 21A14-03 Mineral Occurrence. While encompassing a broad range of locations, such grouping was based upon similarity of mineral occurrence style and association. The 21A14-03 designation has been retained for present purposes, with the exception of the previously noted Shell Bed easterly strike extension.

During the 1994-95 field program the main mining areas were visited and waste rock dumps inspected. Several blocks of potentially auriferous pyritic quartz veining, hosted by magnetite bearing arenaceous material, were located at that time and accordingly sampled (A14PCW295-2).

METALLIC MINERAL OCCURRENCE DATABASE

Occurrence Number: A14-05
Occurrence Name: Delancey Brook
Elements (Potential): (Au, Ag, Mo, Bi, Sb)

Location: Delancey Brook southeast of main road at previously reported NSDNR A14-05 site

County: Annapolis

MTM: 448500 64900

Easting: 5455782 **Northing:** 4973239

NTS: 21A/14

Sample Numbers: no samples taken

Description: The occurrence consists of a 5 m trench and caved adit? on the east bank of Delancey's Brook at this location. A 25-30 cm barren quartz vein and associated stockwork are hosted by thinly bedded biotite hornfels. The adit appears to have been driven on the main 25-30 cm glassy quartz vein with 5% muscovite, 10% chlorite/biotite and < 10% pink feldspar. No visible sulphide is present and the caved area measures approximately 5 m in length. A 15 cm thick quartz, muscovite, Kspar vein occurs 10 m south of the main vein.

Bedding: 020°/66°; **Vein trend:** 010°/25°

METALLIC MINERAL OCCURRENCE DATABASE

Occurrence Number: A14-06
Occurrence Name: Delancey Brook
Elements (Potential): Fe, Cu (Au, Ag, Bi, Sb, Ni)

Location: Delancey Brook southeast of main road at previously described NSDNR
A14-06 site

County: Annapolis

MTM: 448500 64900

Easting: 5455762

Northing: 4973116

NTS: 21A/14

Sample Numbers: A14MPC0207-1,2,3; A14MPC206-1

Description: At this location, rusty weathered, sulphide bearing, medium grained gabbro is cut by a 1 cm to 12 cm thick sulphide bearing quartz vein which was opened by a prospect pit and 3-4 m adit at some time in the past. Pyrite is the dominant vein sulphide present, reaching 15% locally, and may be accompanied by arsenopyrite. The host gabbro shows .5-2% disseminated pyrite/pyrrhotite near the pit. Blasted pits in gabbro also occur 25 m north of the adit and opened a 25 cm quartz vein and stringer zone with minor amounts of disseminated pyrite. The main pit size at this point is approximately 5 m x 1 m x .5 m in sulphide bearing gabbro. The sulphide zone is 1.5 m-2 m in thickness and has been further assessed by additional pitting over 15 m or more to the north.

Rock sample A14MPC206-1 was collected from a smaller area of gabbro hosted quartz stringers and veining that occurs approximately 50 m upstream from the main showing. The gabbro at this point shows a shallowly dipping, pyroxenitic segregation with 2-10% pyrite and pyrrhotite as well as the noted quartz veining, which consists of a 10 cm to 15 cm wide zone of 1 cm to 3 cm thick sulphide barren veins.

Quartz vein trend at adit: 110/84⁰

Quartz vein trend at north pit : 190/40; Quartz vein trend at south exposure: shallowly dipping

METALLIC MINERAL OCCURRENCE DATABASE

Occurrence Number: A14-07
Occurrence Name: Nictaux River
Elements (Potential): Fe, As, Co, Ni, Bi, Ag, Au, Sb, U

Location: At Nictaux Dam approximately 20m north of NSPI dam in mid river and east stream bed outcrops

County: Annapolis

MTM: 448500 65000

Easting: 5458154

Northing: 4968106

NTS: 21A/14

Sample Numbers: A14MPC0052

Description: The occurrence is characterized by fine grained sulphide occurring within an irregular quartz vein array hosted by hornfelsic, sulphidic slates. The contact with Cloud Lake Monzogranite occurs within 20m and veins appear to be related to this intrusion. Numerous thin veins occur in the mid stream exposures, but pyrite and arsenopyrite are concentrated to 15% locally in one 12 cm to 15 cm thick vein showing abundant slate fragments and limited strike extent. Fragments within the vein clearly show S1 foliation, therefore indicating vein emplacement after foliation development. This vein occurs within a distinct 1.0 m wide dilational array of irregular stringers and veins that is broadly confined by local bedding attitude and is spatially associated with a brittle shear 10 cm in width. Sampling results reported by O'Reilly (1994) and by Van Oirschot (1996) confirm the metal suite indicated above, highlighted by Au to 2.2 oz/ton, As to 10%, Co to 1.6%, U to 56 ppm and Ag to 19 ppm. Additional sulphidic quartz veining occurs downstream at the A14-33 occurrence which is also base metal anomalous and uraniferous (10 ppm U; Dickie and Jensen, 1981) and to the east, on Wheelock Brook, at the A14-23 occurrence for which analytical data are not available.

In addition to the quartz veining, a narrow (<5 m), hematized shear within the hornfelsed slates occurs near the east bank, at the foot of the dam and is reported by Dickie and Jensen (1981) as also being uraniferous.

Bedding: 043°/90° at granite contact, 075°/72° 100 m downstream

Sulphide bearing vein trend: 075°/72° approximately

Brittle shears: 060° to 070° >70°

S2 Kink fabric: 110°/90° (locally developed)

METALLIC MINERAL OCCURRENCE DATABASE

Occurrence Number: A14-22
Occurrence Name: Alpena Rd.
Elements (Potential): (U, Ag)

Location: Alpena Road

County: Annapolis

MTM: 448500 65000

Easting: 5455030

Northing: 4968574

NTS: 21A/14

Sample Numbers: A14PCW0267

Description: A reportedly radioactive, irregular zone of light green, silicified hornfels occurs adjacent to a gabbro contact at this location with abundant quartz stringer and vein development. A discrete zone of hydrothermal breccia > 20 cm in width shows silica matrix with altered igneous fragments and finely dispersed albite and epidote in the alteration zone. Several other radioactive alteration zones in this area were prospected by Shell Canada Resources Ltd. (Dickie and Jensen, 1981).

Bedding: 080°/78°

Quartz veining: 160°/70° prevalent; 3 mm to 3 cm thickness common

METALLIC MINERAL OCCURRENCE DATABASE

Occurrence Number: A14-23
Occurrence Name: Wheelock Brook
Elements (Potential): (Au, As, Ag, Bi, Sb, Co)

Location: Wheelock Brook east from Nictaux River

County: Annapolis

MTM: 448500 65000

Easting: 5458653

Northing: 4968478

NTS: 21A/14

Sample Numbers: A14MPC0117-1,2

Description: This occurrence consists of dilatant quartz veins that were opened by a blasted pit many years ago. Thinly bedded, light green to grey sandy siltstone of the White Rock Formation shows a rusty outcrop character in contact with a light tan, rusty weathered intermediate intrusive (dike) or arkosic sandstone showing plagioclase laths locally. White quartz veins from 2-12 cm in thickness carry a mosaic of host rock fragments and show no sulphides where examined.

Stockwork quartz veining debris with minor Kspar also occurs upstream and shows locally abundant coarse grained dark green chlorite at vein selvages. Wall rock bleaching at this location is significant and vein quartz fragments to 25 cm x 10 cm x 15 cm are present. No associated sulphide was noted at this location but this occurrence is otherwise similar to the auriferous, sulphide bearing veins of occurrence A14-07, located a few hundred meters to the southwest.

S0: 055°/78°

Quartz vein: 285°/76°

METALLIC MINERAL OCCURRENCE DATABASE

Occurrence Number: A14-24
Occurrence Name: Albany
Elements (Potential): Fe (Cu, Zn, Pb, Ag)

Location: On bush road immediately north of Alpena Road and Highway 10 junction

County: Annapolis

MTM: 448500 65000

Easting: 5456201

Northing: 4968152

NTS: 21A/14

Sample Numbers: A14MPC0139

Description: This boulder occurrence consists of dark grey green and cream, irregularly banded to laminated chert and siliceous mafic volcanic material containing 2-5% disseminated pyrite. Pyrite occurs parallel to layering and is accompanied by infrequent traces of chalcopyrite. Boulders are scattered and subangular in shape with maximum dimension of 35 cm x 12 cm x 20 cm. Bedrock at the site is Cloud Lake Monzogranite which is cut by a 12-13 cm thick aplite vein and 12 cm thick quartz vein. The mineralized boulder is similar to non-sulphide bearing volcanoclastic breccia of lower Torbrook Formation (or upper Kentville Formation) to the north.

Glacial Striae: 150

Incipient foliation: $075^{\circ}/>50^{\circ}$

Aplite vein trend: $065^{\circ}/90^{\circ}$

Quartz vein trend: $115^{\circ}/90^{\circ}$

METALLIC MINERAL OCCURRENCE DATABASE

Occurrence Number: A14-25
Occurrence Name: Nictaux Rail Cut
Elements (Potential): Fe (Au)

Location: North end of railway cut south of Nictaux Falls

County: Annapolis

MTM: 448500 65000

Easting: 5458714

Northing: 4973287

NTS: 21A/14

Sample Numbers: A14PCW0187

Description: This occurrence is comprised of multiple thin (< 1 cm) quartz veins occurring within 2 m wide zone of strongly foliated to sheared black slate of the Kentville Formation. Disseminated pyrite to 2% characterizes the quartz and is locally present in the slate.

Foliation: $035^{\circ}/90^{\circ}$

Quartz Zone intersection lineation with bedding? or foliation $030^{\circ}/12^{\circ}$

METALLIC MINERAL OCCURRENCE DATABASE

Occurrence Number: A14-26
Occurrence Name: Nictaux Canal
Elements (Potential): (Au)

Location: East side of NSPI canal approximately 320 m SE of #10 highway

County: Annapolis

MTM: 448500 65000

Easting: 5458111

Northing: 4971850

NTS: 21A/14

Sample Numbers: A14PCW0304

Description: Zone of irregularly distributed dark grey quartz veining hosted by locally rusty weathered, dark brown to grey, interbedded siltstone and arenite. Veins are typically less than 15 cm thick, appear to post date foliation, show steep dips and lack sulphides where sampled.

METALLIC MINERAL OCCURRENCE DATABASE

Occurrence Number: A14-27
Occurrence Name: Barteaux Brook #2
Elements (Potential): Fe (Mo, As, Bi, Au) (U, Ag)

Location: Approximately 1450 m south of Lawrencetown swimming pool facility
County: Annapolis
MTM: 448500 65100 **Easting:** 5448578 **Northing:** 4969742 , 4969240
NTS: 21A/14

Sample Numbers: none

Description: At this location a 20 m long section occurs of quartz vein flooded, light cream to grey, saussuritized monzogranite with biotite to 15%. No sulphides were noted. Biotite is strongly hematized and muscovite is locally present. Veining reaches 40% over 1 m x 2 m areas and is irregular in thickness and continuity. Most veins are less than 15 cm in thickness. The zone is indicative of potential greisen association as described by O'Reilly et. al. (1992), and Cormier (1989).

Preferred quartz vein orientation : $120^{\circ}/>50^{\circ}$

METALLIC MINERAL OCCURRENCE DATABASE

Occurrence Number: A14-28
Occurrence Name: Barteaux Brook #1
Elements (Potential): Fe, (Mo, As, Bi, Au) (U, Ag)

Location:: Approximately 1100 m south on brook from Lawrencetown swimming pool facility

County: Annapolis

MTM: 448500 65100

Easting: 5448680

Northing: 4969497

NTS: 21A14

Sample Numbers: A14MPC0166-1

Description: This occurrence consists of a 20 m long section of light green to cream, quartz vein flooded, saussuritized monzogranite with veining accounting for as much as 50% of the section. Veins are typically irregular in thickness and continuity, range from <1.0 cm to 15 cm in thickness and show no obvious sulphide mineralization. Quartz vein sheeting is common and best exposures occur on the east stream bank, 10 m above stream level. Hematitic alteration of biotite is notable. Occurrence is similar to that previously described and could be related to the Inglisville mineralizing system described by Cormier (1989) and Macdonald (1994)

Approximate vein trend: $120^{\circ}/90^{\circ}$

METALLIC MINERAL OCCURRENCE DATABASE

Occurrence Number: A14-29
Occurrence Name: Barteaux Brook #3
Elements (Potential): U, Fe,

Location: West side of Barteaux Brook near Lawrencetown swimming pool facility

County: Annapolis

MTM: 448500 65100

Easting: 5448382

Northing: 4970118

NTS: 21A/14

Sample Numbers: none

Description: This occurrence represents a Shell Canada Resources Ltd. prospect area where surface work revealed altered, equigranular two mica Inglisville Leucomonzogranite with secondary U mineralization on fracture surfaces and local pods of tourmaline. Intense kaolinization of the intrusion is reported from the south end of the exposure zone. This area may be an extension of the alteration and veining systems noted to the south along this stream. The preferred reference is AR 80-013 (Jensen, 1980).

METALLIC MINERAL OCCURRENCE DATABASE

Occurrence Number: A14-30
Occurrence Name: Barteaux Lake Road
Elements (Potential): Fe (Sn, Mo, W, Be, Cu, Zn, Ag, As, Au)

Location: Barteaux Lake Road in old gravel pit on east side of road; pit is approx. 850 m south of bridge at Barteaux Brook

County: Annapolis

MTM: 448000 65100 **Easting:** 5448009 **Northing:** 4966718
NTS: 21A/14

Sample Numbers: A14MPC0012

Description: Gravel pit occurrence of rounded to subangular boulders and cobbles of rusty weathering, quartz, muscovite, pyrite, +/- tourmaline greisen with fine grained, disseminated pyrite to 5 % and local tourmaline. Average boulder size range is 10 cm to 30 cm. Similar cobbles and boulders occur to the north in small road excavations and pits and all are indicative of potential for polymetallic greisen mineralization similar to that at nearby Inglisville.

METALLIC MINERAL OCCURRENCE DATABASE

Occurrence Number: A14-31
Occurrence Name: Crisp Road "Quartzite Showing"
Elements (Potential): U, Ag

Location: Crisp Road
County: Annapolis
MTM: 448500 65100 **Easting:** 5451689 **Northing:** 4668472
NTS: 21A/14

Sample Numbers: none

Description: Uranium occurrence originally documented in Shell Canada Resources Ltd. assessment report AR 81-32 (Jensen, 1981). U was seen to be localized in hematized fractures developed in White Rock Formation quartzite at its contact with the Inglisville Leucomonzogranite intrusion. The prospect was evaluated through detailed grid geological mapping and completion of 8 diamond drill holes that confirmed uraniferous character of the zone and its limited continuity associated with fracturing. Surface showings of autunite and pitchblende on fracture surfaces returned .087% to 3.32% U and further extensions are indicated by locally anomalous U soil geochemistry.

METALLIC MINERAL OCCURRENCE DATABASE

Occurrence Number: A14-32
Occurrence Name: Inglisville Church
Elements (Potential): U (Ag)

Location: Inglisville
County: Annapolis
MTM: 448500 65100 **Easting:** 5451632 **Northing:** 4968902
NTS: 21A/14

Sample Numbers: none from 1994-95

Description: Uranium occurrence is associated with fractured and altered Halifax Formation hornfels adjacent to Inglisville Leucomonzogranite plug. Trenching, blasting and completion of eleven diamond drill holes by Shell Canada Resources Ltd., totaling 606.6 m, tested the zone. The occurrence is associated with strongly altered and fractured zones within the intrusive, near the more shallowly dipping areas of the hornfels - intrusion contact. Outcropping tourmaline bearing, hematized leucogranite is similar to uraniferous altered sections cut by drilling. The best assay results came from two narrow zones that returned values of .36% U_3O_8 over 1.0 m and .03% over 1.0 m. The occurrence as defined by drilling was considered uneconomic, but indicative of a generally favourable style of mineralization. Drilling data are presented in Jensen(1980) and Dickie and Jensen (1981).

METALLIC MINERAL OCCURRENCE DATABASE

Occurrence Number: A14-33
Occurrence Name: Nictaux River

Elements (Potential): Fe, U, Cu, Zn, (Au, As, Ag, Bi, Sb, Co)

Location: Nictaux River at falls approximately 300 m north of NSPI dam and in 70 m section up stream from falls

County: Annapolis

MTM: 448500 65000

Easting: 54588187

Northing: 4968291

NTS: 21A/14

Sample Numbers: A14MPC0056-1, 2, 3, 4

Description: Sulphide bearing granitic and monzonitic veins and a small plug of adjacent Cloud Lake Monzonite intruded quartzitic metasediment/hornfels and a gabbro sill or dike at this location. Rusty weathering monzonite with 2-5% disseminated pyrite and traces of chalcopyrite shows saussuritization and fracture associated control to some sulphide. Moderately dipping granite veins hosted by gabbro, and up to 50 cm thick, occur 25 m downstream and locally carry 10% pyrite. Massive gabbro at falls shows abundant fracture associated pyrite (to 5% locally) as well as a 25-30 cm wide shear with quartz veining and massive pyrite to 5 cm in thickness locally.

A Shell Resources Canada Ltd. report (Dickie and Jensen, 1981) indicates anomalous Zn, Cu and U values at this site. It is probable that the auriferous quartz veining hosted by hornfels at the A14-07 mineral occurrence is contemporaneous with that seen here. The dilatant veining present at the falls exposures appears to be restricted to the gabbro body, thereby limiting it's potential in regard to strike. The possibility of en-echelon, plunging vein arrays should be considered.

Pyritic granite vein trend: $215^{\circ} / 35^{\circ}$

Quartz veined, pyritic shear trend: $200^{\circ} / 40^{\circ}$

Mafic sill trend, approximate: $075^{\circ} / 72^{\circ}$

METALLIC MINERAL OCCURRENCE DATABASE

Occurrence Number: A15-03
Occurrence Name: Nicholasville
Elements (Potential): Mn, Fe, Ba (Au, Ag, As, Sb, Bi, Co)

Location: Northeast of junction of Harmony Road and Palmer Road on Zebe brook

County: Kings

MTM: 449500 64800

Easting: 5473455

Northing: 4981788

NTS: 21A/15

Sample Numbers: A15PCW0056,

Description: This occurrence is described by Felderhof (1978) and the actual mineralization of interest is not exposed at present. A small, single compartment shaft occurs in the stream bed and appears to have been sunk on a 50 cm zone of gouge and clay rich sheared to phylonitic siltstone and shale adjacent to a large carbonitized mafic dike exposure. Massive quartz arenite of the White Rock Formation, Upper Member, occurs 50 m to NW and shows barren white quartz stockwork veining to 40% locally. Felderhof (1978) reports thin < 5 cm thick veins of barite, pyrolusite, quartz and carbonate in altered and fractured ground around and within the mafic intrusions and also reports disseminated to locally massive pyrite from the altered zone as well. These observations are based on results of diamond drilling completed by Nova Scotia Department of Mines in 1959. Reports of underground development of high grade manganese veining up to approximately 1.0 m in width could not be substantiated from drilling information or from field observations.

The intense quartz veining developed within the White Rock Formation at this location may be significant from a precious metals standpoint.

Bedding and mafic sill trend: 080°/90°

Sheared zone trend (approx.): 080°/90°??

METALLIC MINERAL OCCURRENCE DATABASE

Occurrence Number: A15-12
Occurrence Name: Morristown
Elements (Potential): Fe, (Au, Ag)

Location: Gravel pit exposure at west intersection of Canaan and Sturk Roads; east side of gravel pit

County: Kings

MTM: 449500 64700

Easting: 5478409

Northing: 4981362

NTS: 21A/15

Sample Numbers: A15MPC0221

Description: Limonite cemented overburden and rusty, subcropping calcareous arenite and hornfels form a gossanous zone approximately 50 m x 10 m at the east side of a large gravel pit at this location. A 10 m X 3-5 m zone of rusty weathering carbonate bearing quartzite with 1-5% fine grained, disseminated pyrite underlies the gossan and has a probable strike extent, defined by boulder distribution, of greater than 100 m.

The sequence is also characterized by minor amounts of interbedded slate but bedding attitude is poorly represented. No significant quartz or sulphide veining is exposed or present in boulders. Strata of the Halifax Formation - Goldenville Formation transition zone are exposed 1.5 km to the SE in a rock quarry on the Neil Tupper farm, where auriferous sulphides have been reported, along with stream sediment Au anomalies.

Cleavage: 072°/? but assumed to be steep

Bedding: 070°/? but assumed to be steep

METALLIC MINERAL OCCURRENCE DATABASE

Occurrence Number: A15-13
Occurrence Name: Factorydale
Elements (Potential): Mn, Ba, (Au, Ag, Bi, Co)

Location: North of Factorydale Pond on South Annapolis River
County: Kings
MTM: 449500 64700 **Easting:** 5477663 **Northing:** 4983225
NTS: 21A/15

Sample Numbers: A15MPC0173, (A15MPC0174, A15MPC0175-1,2)

Description: Irregular quartz-calcite-rhodocrosite veins occur at this location in strongly cleaved grey slate hosting a pinch and swell structured, carbonatized mafic dike. Tension gash quartz vein morphology is dominant with veins from 2 mm to 20 cm in thickness, and up to 3m in length. These locally carry up to 50% deep pink to red rhodocrosite and minor barite. Moderate bleaching of host wallrock is characteristic, as is dark chlorite at vein margins. The outcrop is pervasively affected by an "S" sense crenulation or kink fabric of S2 association. Quartz veins cut S1 foliation and locally parallel S2 fabric.

Bedding : $055^{\circ}/90^{\circ}$

Bedding S1 foliation intersection: $055^{\circ}/34^{\circ}$

Crenulation/kink S2 foliation: $130^{\circ}/90^{\circ}$

Prominent quartz vein trend: $160^{\circ}/90^{\circ}$

METALLIC MINERAL OCCURRENCE DATABASE

Occurrence Number: A15-14
Occurrence Name: Factorydale
Elements (Potential): (Au, As)

Location: Beales Falls: Approximately 500m southwest of Factorydale headpond on west branch of South Annapolis River

County: Kings

MTM: 449500 64700

Easting: 5477143

Northing: 4982153

NTS: 21A/15

Sample Numbers: A15MPC0214-1, 2

Description: At this location a 40 cm zone of complex tension gash quartz veining occurs within strongly cleaved and locally sheared dark grey blue slate of the Halifax Formation or basal White Rock Formation. The zone appears to have been opened up by blasting in a west bank exposure and shows no associated sulphides in the veins. Disseminated pyrite to 1% is present 10 m to south in a 4 m thick fine grained volcanic tuff unit of the White Rock Formation. Veining is confined by the foliation trend.

Bedding: 230°/80°

S1 foliation: 230°/80-90°

METALLIC MINERAL OCCURRENCE DATABASE

Occurrence Number: A15-15
Occurrence Name: Bloomington Road East
Elements (Potential): Fe (Cu, Zn, Au)

Location: Approximately 1 km NE of Black River Bridge on forest road north of Bloomington Road; road ditch exposures may have been trenched in past

County: Annapolis
MTM: 448500 64900 **Easting:** 5461831 **Northing:** 4971668
NTS: 21A/15

Sample Numbers: A15MPC0168
A15MPC0169

Description: At this location a gossanous zone of hornfelsic, pyritic black slate boulders and outcrop is exposed. Fine grained pyrite and pyrrhotite to 10% occur as disseminated phases and on fracture surfaces and sillimanite? is developed locally. The north ditch exposure is approximately 60 m X 5 m in dimension and similar material is exposed in a more restricted area on the south side of the road, 40m on strike to the east. Rusty slabs 50 cm X 20 cm X 15 cm are abundant.

Bedding: 035°/90°
S1 foliation: 035°/90°?

METALLIC MINERAL OCCURRENCE DATABASE

Occurrence Number: A15-16
Occurrence Name: Torbrook Landfill
Elements (Potential): Fe, Ca (Zn, Pb, Cu)

Location: Annapolis County Construction Landfill site at Torbrook; occurrence in western-most exposures at site

County: Annapolis

MTM: 448500 64900

Easting: 5461786

Northing: 4973618

NTS: 21A/15

Sample Numbers: A15MPC0074

Description: At this location a dark black, highly fossiliferous limestone unit 1.5-2 m thick shows disseminated fine and coarse grained pyrite to 10% locally and is characterized by pervasive presence of ostracod and crinoid stem debris. Sulphide shows bright, non-weathered surfaces and also occurs in adjacent dark grey to black, strongly fissile slate showing generally rusty weathering style and occasional irregular quartz stringers and veins to 15 cm in thickness. No vein sulphides were noted. Host sequence is Torbrook Formation and is locally affected by shearing.

S1 foliation: $033^{\circ}/74^{\circ}$

Possible S0/S1 intersection: $030^{\circ}/10^{\circ}-15^{\circ}$

METALLIC MINERAL OCCURRENCE DATABASE

Occurrence Number: A15-17 (also member of previous A15-1 NSDNR Occurrence Group)
Occurrence Name: Torbrook East
Elements (Potential): Fe, Mn

Location: North of Torbrook Road behind heavy equipment yard at pond.
County: Annapolis
MTM: 449000 64900 **Easting:** 5461385 **Northing:** 4975113
NTS: 21A/15

Sample Numbers: none

Description: The NE extension of the previously mined Shell Bed hematitic quartzite unit is indicated at this location by waterfilled trenches. cursory inspection did not reveal any significant differences from main A-14-03 mineral occurrence on strike to the west.

METALLIC MINERAL OCCURRENCE DATABASE

Occurrence Number: A15-18
Occurrence Name: Spinney Brook
Elements (Potential): P

Location: Spinney Brook, immediately north of bridge on road parallel to stream between Torbrook Road and Messenger Road

County: Annapolis

MTM: 449000 64900

Easting: 5464543

Northing: 4976138

NTS: 21A/15

Sample Numbers: A15MPC0038

Description: Torbrook Formation strata at this location consist of dark grey, thinly interbedded to laminated, calcareous siltstone and silty limestone with discontinuous orange to tan weathering phosphatic laminae to 0.5 cm in thickness and nodular carbonate to 1 cm in thickness. Phosphatic laminae are most prevalent over a 25 m section upstream from bridge but form less than 10% of the section. Exposures downstream are also calcareous, with local limestone and carbonate nodule development with trace pyrite and minor volcanogenic sediment/tuff interbeds. Jensen (1979) considered the occurrence of phosphatic laminae to be characteristic of this Torbrook Formation stratigraphic interval.

Bedding: 045°/90° to 042°/78°

Kink fabric: 130°/90°; dextral

METALLIC MINERAL OCCURRENCE DATABASE

Occurrence Number: A15-19
Occurrence Name: Torbrook South
Elements (Potential): Fe, (Mn)

Location: Approximately 350 m south of Annapolis County Construction Landfill site
County: Annapolis
MTM: 448500 64900 **Easting:** 5462286-5461776 **Northing:** 4973713-4973180
NTS: 21A/15

Sample Numbers: none

Description: This occurrence defines the South Mountain Fe bed trend described by Wright (1975). This 2.5 m thick, dark grey, magnetite bearing quartz arenite bed has been traced from Black River easterly by trenching, diamond drilling and magnetometer surveys. Ten diamond drill holes show strike extension east of the river to be at least 2.0 km and confirmation by trenching characterizes several intervals. Fe levels less than 40% restricted exploration interest in these beds according to Wright (1975) and during 1956-57 exploration by Torbrook Iron Mines Limited was undertaken as part of a district assessment (Stonehouse, 1957, 1958). Trench and drillhole locations are plotted on the appropriate report geological maps.

Bedding trend: 043°/85°

METALLIC MINERAL OCCURRENCE DATABASE

Occurrence Number: A15-20
Occurrence Name: Crocker Road
Elements (Potential): Fe, (Sn, W, Mo, Bi, Sb,Cu, Zn, Pb, As, Au, Ag, Co)

Location: Gravel pit at southwest corner of Crocker Road loop

County: Kings

MTM: 449000 64800

Easting: 5471434

Northing: 4978340

NTS: 21A/15

Sample Numbers: A15PCW0028, 029, 033

Description: This occurrence is characterized by several rusty weathering boulders of medium grey, fine grained, siliceous greisenized arenite and hornfels? that show fine grained disseminated pyrite to 5% locally, abundant white mica, and minor amounts of accicular tourmaline. Boulder size reaches 40 cm X 25 cm X 20 cm and most are located in a pile of oversize material on the west side of the pit. A 0.8 m boulder of non sulphide bearing felsic, igneous autobreccia, locally showing a massive, dark green chlorite matrix, also occurs in this pile. Sulphide bearing boulders are subrounded and the autobreccia boulder is subangular to subrounded. All of these are believed to be sourced from the Cloud Lake Monzogranite to the south.

Bedding: 235°/75°

APPENDIX III

OUTCROP LOCATION DATA FILES

SILURIAN METALLOGENY PROJECT
OUTCROP STATION LOCATIONS

STATION NUMBER	MTM		NTS SHEET	MTM SHEET
	EASTING	NORTHING		
A14ABH0038	5459144	4967594	21A14	448000-65000
A14ABH0039	5459152	4967578	21A14	448000-64900
A14ABH0040	5459102	4967367	21A14	448000-65000
A14ABH0041	5459160	4967303	21A14	448000-65000
A14ABH0042	5459174	4966951	21A14	448000-65000
A14ABH0043	5459232	4966893	21A14	448000-65000
A14ABH0044	5459240	4966787	21A14	448000-65000
A14ABH0045	5458376	4968786	21A14	448500-65000
A14ABH0046	5458394	4968815	21A14	448500-65000
A14ABH0047	5458407	4968840	21A14	448500-65000
A14ABH0048	5458476	4969510	21A14	448500-65000
A14ABH0049	5452141	4970829	21A14	448500-65100
A14ABH0050	5452176	4970843	21A14	448500-65100
A14ABH0051	5452272	4970888	21A14	448500-65100
A14ABH0052	5452321	4970908	21A14	448500-65100
A14ABH0053	5452457	4970971	21A14	448500-65100
A14ABH0054	5452486	4970982	21A14	448500-65100
A14ABH0055	5453475	4971424	21A14	448500-65000
A14ABH0056	5453554	4971460	21A14	448500-65000
A14ABH0057	5453955	4971637	21A14	448500-65000
A14ABH0058	5454000	4971658	21A14	448500-65000
A14ABH0059	5454050	4971680	21A14	448500-65000
A14ABH0060	5454109	4971707	21A14	448500-65000
A14ABH0061	5454142	4971722	21A14	448500-65000
A14ABH0062	5454196	4971747	21A14	448500-65000
A14ABH0063	5454245	4971767	21A14	448500-65000
A14ABH0064	5454280	4971782	21A14	448500-65000
A14ABH0065	5454312	4971796	21A14	448500-65000
A14ABH0066	5454354	4971814	21A14	448500-65000
A14ABH0067	5454403	4971838	21A14	448500-65000
A14ABH0068	5454460	4971861	21A14	448500-65000
A14ABH0069	5454532	4971894	21A14	448500-65000
A14ABH0070	5454614	4971929	21A14	448500-65000
A14ABH0070	5454679	4971959	21A14	448500-65000
A14ABH0071	5454716	4971975	21A14	448500-65000
A14ABH0072	5454834	4972028	21A14	448500-65000
A14ABH0073	5454853	4972035	21A14	448500-65000
A14ABH0074	5454945	4972075	21A14	448500-65000
A14ABH0074	5454985	4972094	21A14	448500-65000
A14ABH0075	5455036	4972116	21A14	448500-65000
A14ABH0075	5455085	4972139	21A14	448500-65000
A14ABH0075	5455180	4972180	21A14	448500-65000
A14ABH0075	5455230	4972202	21A14	448500-65000
A14ABH0076	5455376	4972270	21A14	448500-65000
A14ABH0076	5455482	4972320	21A14	448500-65000
A14ABH0077	5455555	4972352	21A14	448500-65000
A14ABH0077	5455616	4972380	21A14	448500-65000
A14ABH0077	5455676	4972407	21A14	448500-65000
A14ABH0077	5455784	4972455	21A14	448500-65000

**SILURIAN METALLOGENY PROJECT
OUTCROP STATION LOCATIONS**

STATION NUMBER	MTM		NTS SHEET	MTM SHEET
	EASTING	NORTHING		
A14ABH0078	5455992	4972549	21A14	448500-65000
A14ABH0079	5456062	4972578	21A14	448500-65000
A14ABH0080	5456120	4972603	21A14	448500-65000
A14ABH0081	5456185	4972633	21A14	448500-65000
A14ABH0081	5456277	4972673	21A14	448500-65000
A14ABH0082	5456440	4972743	21A14	448500-65000
A14ABH0083	5456494	4972767	21A14	448500-65000
A14ABH0084	5456571	4972802	21A14	448500-65000
A14ABH0084	5456604	4972818	21A14	448500-65000
A14ABH0084	5456659	4972841	21A14	448500-65000
A14ABH0084	5456686	4972854	21A14	448500-65000
A14ABH0085	5456823	4972915	21A14	448500-65000
A14ABH0086	5456864	4972933	21A14	448500-65000
A14ABH0087	5456892	4972945	21A14	448500-65000
A14ABH0088	5457202	4973084	21A14	448500-65000
A14ABH0089	5457212	4973088	21A14	448500-65000
A14ABH0090	5457248	4973104	21A14	448500-65000
A14ABH0091	5456689	4971804	21A14	448500-65000
A14ABH0091	5456699	4971817	21A14	448500-65000
A14ABH0092	5456595	4972077	21A14	448500-65000
A14ABH0093	5456505	4972304	21A14	448500-65000
A14ABH0094	5456495	4972318	21A14	448500-65000
A14ABH0095	5456476	4972358	21A14	448500-65000
A14ABH0096	5456453	4972410	21A14	448500-65000
A14ABH0097	5456407	4972522	21A14	448500-65000
A14ABH0098	5456368	4972635	21A14	448500-65000
A14ABH042B	5458141	4968666	21A14	448500-65000
A14ABH043B	5458188	4968674	21A14	448500-65000
A14ABH044B	5458318	4968726	21A14	448500-65000
A14ABH????	5458832	4967110	21A14	448000-65000
A14MPC0001	5450370	4968373	21A14	448500-65100
A14MPC0001	5450390	4968382	21A14	448500-65100
A14MPC0002	5450245	4968281	21A14	448500-65100
A14MPC0002	5450255	4968318	21A14	448500-65100
A14MPC0003	5449613	4968222	21A14	448500-65100
A14MPC0004	5449436	4968173	21A14	448500-65100
A14MPC0005	5448694	4967564	21A14	448000-65100
A14MPC0005	5448723	4967530	21A14	448000-65100
A14MPC0006	5448848	4967399	21A14	448000-65100
A14MPC0007	5448872	4967300	21A14	448000-65100
A14MPC0008	5448904	4967210	21A14	448000-65100
A14MPC0008	5448918	4967199	21A14	448000-65100
A14MPC0009	5448945	4967142	21A14	448000-65100
A14MPC0010	5449091	4966686	21A14	448000-65100
A14MPC0011	5449272	4966425	21A14	448000-65100
A14MPC0011	5449279	4966409	21A14	448000-65100
A14MPC0011	5449286	4966393	21A14	448000-65100
A14MPC0012	5449344	4966122	21A14	448000-65100
A14MPC0013	5449329	4966014	21A14	448000-65100

**SILURIAN METALLOGENY PROJECT
OUTCROP STATION LOCATIONS**

STATION NUMBER	MTM		NTS SHEET	MTM SHEET
	EASTING	NORTHING		
A14MPC0014	5449112	4967790	21A14	448000-65100
A14MPC0015	5448463	4968306	21A14	448500-65100
A14MPC0016	5448293	4968492	21A14	448500-65100
A14MPC0017	5447878	4968723	21A14	448500-65100
A14MPC0017	5448162	4968576	21A14	448500-65100
A14MPC0018	5447400	4968696	21A14	448500-65100
A14MPC0018	5447445	4968696	21A14	448500-65100
A14MPC0019	5449166	4968780	21A14	448500-65100
A14MPC0020	5448475	4970358	21A14	448500-65100
A14MPC0021	5453547	4969446	21A14	448500-65000
A14MPC0021	5453588	4969332	21A14	448500-65000
A14MPC0023	5451836	4968452	21A14	448500-65100
A14MPC0023	5451855	4968425	21A14	448500-65100
A14MPC0024	5451171	4968093	21A14	448500-65100
A14MPC0024	5452169	4968211	21A14	448500-65100
A14MPC0025	5452692	4967874	21A14	448000-65000
A14MPC0025	5452712	4967865	21A14	448000-65000
A14MPC0025	5452493	4967964	21A14	448500-65100
A14MPC0026	5452814	4967798	21A14	448000-65000
A14MPC0027	5453003	4967642	21A14	448000-65000
A14MPC0027	5453029	4967623	21A14	448000-65000
A14MPC0027	5453063	4967597	21A14	448000-65000
A14MPC0027	5453139	4967558	21A14	448000-65000
A14MPC0027	5453198	4967464	21A14	448000-65000
A14MPC0028	5458044	4972083	21A14	448500-65000
A14MPC0029	5457997	4971892	21A14	448500-65000
A14MPC0030	5457942	4971636	21A14	448500-65000
A14MPC0031	5457983	4971426	21A14	448500-65000
A14MPC0032	5458054	4971152	21A14	448500-65000
A14MPC0032	5458057	4971186	21A14	448500-65000
A14MPC0032	5458061	4971173	21A14	448500-65000
A14MPC0033	5458016	4970399	21A14	448500-65000
A14MPC0034	5457826	4969895	21A14	448500-65000
A14MPC0035	5457546	4969053	21A14	448500-65000
A14MPC0035	5457555	4969061	21A14	448500-65000
A14MPC0035	5457560	4969069	21A14	448500-65000
A14MPC0035	5457608	4969081	21A14	448500-65000
A14MPC0036	5457203	4968573	21A14	448500-65000
A14MPC0037	5457131	4968509	21A14	448500-65000
A14MPC0038	5456119	4967086	21A14	448000-65000
A14MPC0038	5456183	4967182	21A14	448000-65000
A14MPC0052	5458154	4968106	21A14	448500-65000
A14MPC0053	5458204	4968134	21A14	448500-65000
A14MPC0054	5458199	4968187	21A14	448500-65000
A14MPC0055	5458199	4968217	21A14	448500-65000
A14MPC0056	5458199	4968304	21A14	448500-65000
A14MPC0057	5458430	4968334	21A14	448500-65000
A14MPC0058	5458535	4968459	21A14	448500-65000
A14MPC0059	5458588	4968520	21A14	448500-65000

**SILURIAN METALLOGENY PROJECT
OUTCROP STATION LOCATIONS**

STATION NUMBER	MTM		NTS	MTM
	EASTING	NORTHING	SHEET	SHEET
A14MPC0060	5458669	4968634	21A14	448500-65000
A14MPC0061	5458635	4968745	21A14	448500-65000
A14MPC0062	5458599	4968817	21A14	448500-65000
A14MPC0063	5458566	4968906	21A14	448500-65000
A14MPC0064	5458555	4968937	21A14	448500-65000
A14MPC0065	5458599	4968998	21A14	448500-65000
A14MPC0066	5458649	4969362	21A14	448500-65000
A14MPC0067	5458738	4969540	21A14	448500-65000
A14MPC0068	5458638	4969756	21A14	448500-65000
A14MPC0068	5458657	4969748	21A14	448500-65000
A14MPC0069	5458574	4970081	21A14	448500-65000
A14MPC0070	5458571	4970140	21A14	448500-65000
A14MPC0071	5458585	4970170	21A14	448500-65000
A14MPC0072	5458760	4970423	21A14	448500-65000
A14MPC0073	5458793	4970635	21A14	448500-65000
A14MPC0074	5458859	4970707	21A14	448500-65000
A14MPC0075	5458977	4970818	21A14	448500-65000
A14MPC0076	5459003	4970890	21A14	448500-65000
A14MPC0077	5459132	4970971	21A14	448500-65000
A14MPC0078	5459152	4971023	21A14	448500-65000
A14MPC0079	5459156	4971051	21A14	448500-65000
A14MPC0080	5459156	4971089	21A14	448500-65000
A14MPC0081	5459014	4971536	21A14	448500-65000
A14MPC0082	5459128	4971625	21A14	448500-65000
A14MPC0083	5459211	4971695	21A14	448500-65000
A14MPC0084	5458848	4972165	21A14	448500-65000
A14MPC0085	5458743	4972265	21A14	448500-65000
A14MPC0086	5458724	4972420	21A14	448500-65000
A14MPC0086	5458732	4972398	21A14	448500-65000
A14MPC0087	5458874	4972695	21A14	448500-65000
A14MPC0088	5458894	4972734	21A14	448500-65000
A14MPC0089	5458944	4972968	21A14	448500-65000
A14MPC0090	5458665	4973435	21A14	448500-65000
A14MPC0092	5458087	4974352	21A14	449000-65000
A14MPC0092	5458087	4974414	21A14	449000-65000
A14MPC0092	5458105	4974455	21A14	449000-65000
A14MPC0092	5458134	4974494	21A14	449000-65000
A14MPC0093	5458194	4974121	21A14	449000-65000
A14MPC0094	5458245	4974041	21A14	449000-65000
A14MPC0095	5458261	4974020	21A14	449000-65000
A14MPC0096	5458238	4973794	21A14	449000-65000
A14MPC0096	5458245	4973745	21A14	449000-65000
A14MPC0097	5458380	4973665	21A14	449000-65000
A14MPC0098	5458391	4973628	21A14	449000-65000
A14MPC0099	5458391	4973501	21A14	449000-65000
A14MPC0100	5458437	4973443	21A14	448500-65000
A14MPC0100	5458464	4973435	21A14	448500-65000
A14MPC0100	5458464	4973450	21A14	448500-65000
A14MPC0100	5458488	4973457	21A14	448500-65000

**SILURIAN METALLOGENY PROJECT
OUTCROP STATION LOCATIONS**

STATION NUMBER	MTM		NTS SHEET	MTM SHEET
	EASTING	NORTHING		
A14MPC0100	5458494	4973443	21A14	448500-65000
A14MPC0100	5458523	4973450	21A14	448500-65000
A14MPC0116	5458619	4968532	21A14	448500-65000
A14MPC0117	5458655	4968476	21A14	448500-65000
A14MPC0118	5458713	4968426	21A14	448500-65000
A14MPC0119	5458734	4968325	21A14	448500-65000
A14MPC0120	5458771	4968283	21A14	448500-65000
A14MPC0121	5458785	4968269	21A14	448500-65000
A14MPC0122	5458864	4968234	21A14	448500-65000
A14MPC0123	5458887	4968223	21A14	448500-65000
A14MPC0124	5458909	4968208	21A14	448500-65000
A14MPC0125	5458938	4968166	21A14	448500-65000
A14MPC0126	5458938	4968099	21A14	448500-65000
A14MPC0127	5458951	4968072	21A14	448500-65000
A14MPC0128	5458965	4968049	21A14	448500-65000
A14MPC0129	5458980	4968027	21A14	448500-65000
A14MPC0130	5459020	4967835	21A14	448000-65000
A14MPC0130	5459041	4967914	21A14	448500-65000
A14MPC0131	5459039	4967774	21A14	448000-65000
A14MPC0131	5459057	4967761	21A14	448000-65000
A14MPC0132	5459237	4967578	21A14	448000-65000
A14MPC0132	5459332	4967586	21A14	448000-65000
A14MPC0133	5459504	4967589	21A14	448000-65000
A14MPC0134	5459774	4967645	21A14	448000-65000
A14MPC0135	5459843	4967674	21A14	448000-65000
A14MPC0136	5456494	4968080	21A14	448500-65000
A14MPC0137	5456358	4968151	21A14	448500-65000
A14MPC0138	5456312	4968150	21A14	448500-65000
A14MPC0139	5456146	4968143	21A14	448500-65000
A14MPC0139	5456162	4968148	21A14	448500-65000
A14MPC0139	5456177	4968153	21A14	448500-65000
A14MPC0140	5456857	4968296	21A14	448500-65000
A14MPC0141	5456620	4968512	21A14	448500-65000
A14MPC0141	5456625	4968503	21A14	448500-65000
A14MPC0141	5456638	4968496	21A14	448500-65000
A14MPC0142	5456410	4968613	21A14	448500-65000
A14MPC0143	5456377	4968629	21A14	448500-65000
A14MPC0144	5456164	4968678	21A14	448500-65000
A14MPC0145	5456117	4968943	21A14	448500-65000
A14MPC0145	5456117	4968972	21A14	448500-65000
A14MPC0145	5456117	4969003	21A14	448500-65000
A14MPC0145	5456117	4969036	21A14	448500-65000
A14MPC0145	5456143	4969065	21A14	448500-65000
A14MPC0147	5459418	4973363	21A14	448500-85000
A14MPC0148	5459488	4973192	21A14	448500-65000
A14MPC0149	5459551	4973029	21A14	448500-65000
A14MPC0150	5460348	4971244	21A14	448500-65000
A14MPC0151	5460320	4970986	21A14	448500-65000
A14MPC0152	5460462	4970781	21A14	448500-65000

**SILURIAN METALLOGENY PROJECT
OUTCROP STATION LOCATIONS**

STATION NUMBER	MTM		NTS SHEET	MTM SHEET
	EASTING	NORTHING		
A14MPC0160	5448779	4969274	21A14	448500-65100
A14MPC0161	5448795	4969299	21A14	448500-65100
A14MPC0162	5448795	4969342	21A14	448500-65100
A14MPC0163	5448704	4969494	21A14	448500-65100
A14MPC0164	5448688	4969548	21A14	448500-65100
A14MPC0165	5448631	4969682	21A14	448500-65100
A14MPC0166	5448583	4969743	21A14	448500-65100
A14MPC0167	5448533	4969914	21A14	448500-65100
A14MPC0168	5448453	4970051	21A14	448500-65100
A14MPC0169	5448354	4970242	21A14	448500-65100
A14MPC0170	5452095	4971576	21A14	448500-65100
A14MPC0171	5452124	4971553	21A14	448500-65100
A14MPC0172	5452186	4971518	21A14	448500-65100
A14MPC0173	5452218	4971489	21A14	448500-65100
A14MPC0174	5452257	4971467	21A14	448500-65100
A14MPC0175	5452311	4971487	21A14	448500-65100
A14MPC0176	5452341	4971473	21A14	448500-65100
A14MPC0177	5452364	4971455	21A14	448500-65100
A14MPC0178	5452522	4971305	21A14	448500-65100
A14MPC0179	5452537	4971293	21A14	448500-65100
A14MPC0180	5452546	4971279	21A14	448500-65100
A14MPC0188	5456040	4971769	21A14	448500-65000
A14MPC0188	5456053	4971766	21A14	448500-65000
A14MPC0189	5455883	4971789	21A14	448500-65000
A14MPC0189	5455891	4971794	21A14	448500-65000
A14MPC0190	5455881	4971820	21A14	448500-65000
A14MPC0191	5455749	4972082	21A14	448500-65000
A14MPC0192	5455801	4972150	21A14	448500-65000
A14MPC0193	5455870	4972304	21A14	448500-65000
A14MPC0194	5455842	4972358	21A14	448500-65000
A14MPC0195	5455842	4972394	21A14	448500-65000
A14MPC0196	5455840	4972446	21A14	448500-65000
A14MPC0197	5455840	4972500	21A14	448500-65000
A14MPC0198	5455840	4972561	21A14	448500-65000
A14MPC0199	5455774	4972734	21A14	448500-65000
A14MPC0200	5455777	4972778	21A14	448500-65000
A14MPC0201	5455782	4972896	21A14	448500-65000
A14MPC0202	5455756	4972939	21A14	448500-65000
A14MPC0203	5455734	4972994	21A14	448500-65000
A14MPC0204	5455734	4973004	21A14	448500-65000
A14MPC0205	5455734	4973074	21A14	448500-65000
A14MPC0206	5455782	4973145	21A14	448500-65000
A14MPC0207	5455782	4973202	21A14	448500-65000
A14MPC0208	5455767	4973275	21A14	448500-65000
A14MPC0209	5455741	4973335	21A14	448500-65000
A14MPC0210	5455708	4973386	21A14	448500-65000
A14MPC0211	5455697	4973404	21A14	448500-65000
A14MPC0220	5456161	4971059	21A14	448500-65000
A14MPC0221	5456151	4970899	21A14	448500-65000

**SILURIAN METALLOGENY PROJECT
OUTCROP STATION LOCATIONS**

STATION NUMBER	MTM		NTS SHEET	MTM SHEET
	EASTING	NORTHING		
A14MPC0222	5456327	4970756	21A14	448500-65000
A14MPC0223	5456288	4970647	21A14	448500-65000
A14MPC0224	5456309	4970563	21A14	448500-65000
A14MPC0225	5456387	4970482	21A14	448500-65000
A14MPC0226	5456459	4970251	21A14	448500-65000
A14MPC0227	5456467	4970176	21A14	448500-65000
A14MPC0228	5456651	4969618	21A14	448500-65000
A14MPC0228	5456695	4969626	21A14	448500-65000
A14MPC0229	5456317	4969394	21A14	448500-65000
A14MPC0230	5455004	4969738	21A14	448500-65000
A14MPC0231	5455206	4969787	21A14	448500-65000
A14MPC0232	5455308	4969810	21A14	448500-65000
A14MPC0234	5455539	4969893	21A14	448500-65000
A14MPC0235	5455547	4969940	21A14	448500-65000
A14MPC0236	5455510	4970067	21A14	448500-65000
A14MPC0237	5455490	4970150	21A14	448500-65000
A14MPC0238	5455414	4970408	21A14	448500-65000
A14MPC0239	5455458	4970482	21A14	448500-65000
A14MPC0240	5455565	4970535	21A14	448500-65000
A14MPC0241	5455614	4970555	21A14	448500-65000
A14MPC0242	5455813	4970735	21A14	448500-65000
A14MPC0243	5455928	4970794	21A14	448500-65000
A14MPC0244	5455982	4970981	21A14	448500-65000
A14MPC0245	5454519	4969665	21A14	448500-65000
A14MPC0246	5454413	4969885	21A14	448500-65000
A14MPC0247	5454403	4970415	21A14	448500-65000
A14PCW0001	5446047	4967425	21A14	448000-65100
A14PCW0002	5446143	4967194	21A14	448000-65100
A14PCW0003	5446169	4967136	21A14	448000-65100
A14PCW0003	5446187	4967091	21A14	448000-65100
A14PCW0003	5446222	4967004	21A14	448000-65100
A14PCW0003	5446254	4966934	21A14	448000-65100
A14PCW0003	5446350	4966709	21A14	448000-65100
A14PCW0004	5446398	4966610	21A14	448000-65100
A14PCW0004	5446410	4966566	21A14	448000-65100
A14PCW0004	5446439	4966494	21A14	448000-65100
A14PCW0004	5446470	4966404	21A14	448000-65100
A14PCW0005	5446486	4966369	21A14	448000-65100
A14PCW0005	5446493	4966362	21A14	448000-65100
A14PCW0005	5446502	4966353	21A14	448000-65100
A14PCW0007	5447394	4967735	21A14	448000-65100
A14PCW0008	5447506	4967193	21A14	448000-65100
A14PCW0009	5447677	4966889	21A14	448000-65100
A14PCW0010	5447637	4966785	21A14	448000-65100
A14PCW0010	5447640	4966797	21A14	448000-65100
A14PCW0010	5447643	4966806	21A14	448000-65100
A14PCW0011	5447640	4966710	21A14	448000-65100
A14PCW0011	5447650	4966710	21A14	448000-65100
A14PCW0012	5448714	4967405	21A14	448000-65100

**SILURIAN METALLOGENY PROJECT
OUTCROP STATION LOCATIONS**

STATION NUMBER	MTM		NTS SHEET	MTM SHEET
	EASTING	NORTHING		
A14PCW0015	5457155	4967196	21A14	448000-65000
A14PCW0016	5456959	4966380	21A14	448000-65000
A14PCW0017	5457030	4966821	21A14	448000-65000
A14PCW0018	5450101	4967898	21A14	448000-65100
A14PCW0019	5450163	4967680	21A14	448000-65100
A14PCW0020	5450199	4967598	21A14	448000-65100
A14PCW0021	5450203	4967640	21A14	448000-65100
A14PCW0021	5450220	4967646	21A14	448000-65100
A14PCW0021	5450252	4967578	21A14	448000-65100
A14PCW0021	5450252	4967596	21A14	448000-65100
A14PCW0023	5450316	4967648	21A14	448000-65100
A14PCW0024	5450262	4967515	21A14	448000-65100
A14PCW0024	5450272	4967465	21A14	448000-65100
A14PCW0025	5450401	4967257	21A14	448000-65100
A14PCW0026	5450542	4967136	21A14	448000-65100
A14PCW0026	5450546	4967146	21A14	448000-65100
A14PCW0027	5450463	4967187	21A14	448000-65100
A14PCW0028	5450668	4966906	21A14	448000-65100
A14PCW0029	5450576	4966897	21A14	448000-65100
A14PCW0030	5450632	4966804	21A14	448000-65100
A14PCW0031	5450905	4966539	21A14	448000-65100
A14PCW0032	5449836	4968964	21A14	448500-65100
A14PCW0033	5449828	4969067	21A14	448500-65100
A14PCW0034	5449828	4969216	21A14	448500-65100
A14PCW0034	5449832	4969202	21A14	448500-65100
A14PCW0034	5449836	4969275	21A14	448500-65100
A14PCW0035	5449765	4969625	21A14	448500-65100
A14PCW0035	5449771	4969613	21A14	448500-65100
A14PCW0036	5449803	4969914	21A14	448500-65100
A14PCW0037	5449578	4970075	21A14	448500-65100
A14PCW0037	5449592	4970067	21A14	448500-65100
A14PCW0038	5449399	4970140	21A14	448500-65100
A14PCW0038	5449476	4970114	21A14	448500-65100
A14PCW0039	5449030	4970358	21A14	448500-65100
A14PCW0040	5452135	4971621	21A14	448500-65100
A14PCW0041	5452215	4971571	21A14	448500-65100
A14PCW0041	5452322	4971551	21A14	448500-65100
A14PCW0042	5452270	4971545	21A14	448500-65100
A14PCW0043	5452545	4971372	21A14	448500-65100
A14PCW0044	5452678	4971412	21A14	448500-65000
A14PCW0045	5452640	4971482	21A14	448500-65000
A14PCW0045	5452643	4971515	21A14	448500-65000
A14PCW0045	5452651	4971550	21A14	448500-65000
A14PCW0045	5452678	4971497	21A14	448500-65000
A14PCW0045	5452681	4971537	21A14	448500-65000
A14PCW0046	5452762	4971395	21A14	448500-65000
A14PCW0047	5452932	4971709	21A14	448500-65000
A14PCW0048	5453667	4971106	21A14	448500-65000
A14PCW0049	5453282	4970606	21A14	448500-65000

**SILURIAN METALLOGENY PROJECT
OUTCROP STATION LOCATIONS**

STATION NUMBER	MTM		NTS	MTM
	EASTING	NORTHING	SHEET	SHEET
A14PCW0050	5453123	4970432	21A14	448500-65000
A14PCW0050	5453157	4970481	21A14	448500-65000
A14PCW0050	5453240	4970529	21A14	448500-65000
A14PCW0051	5453553	4970539	21A14	448500-65000
A14PCW0052	5453580	4970474	21A14	448500-65000
A14PCW0053	5453655	4970304	21A14	448500-65000
A14PCW0054	5451976	4971020	21A14	448500-65100
A14PCW0055	5451949	4970878	21A14	448500-65100
A14PCW0056	5452114	4970719	21A14	448500-65100
A14PCW0057	5452367	4970087	21A14	448500-65100
A14PCW0058	5451949	4969970	21A14	448500-65100
A14PCW0059	5451946	4969993	21A14	448500-65100
A14PCW0060	5451913	4970027	21A14	448500-65100
A14PCW0061	5451879	4970060	21A14	448500-65100
A14PCW0062	5451862	4970084	21A14	448500-65100
A14PCW0063	5451855	4970121	21A14	448500-65100
A14PCW0064	5451855	4970135	21A14	448500-65100
A14PCW0065	5451818	4970199	21A14	448500-65100
A14PCW0066	5451788	4970242	21A14	448500-65100
A14PCW0066	5451794	4970226	21A14	448500-65100
A14PCW0067	5451633	4970444	21A14	448500-65100
A14PCW0067	5451677	4970396	21A14	448500-65100
A14PCW0068	5451611	4970468	21A14	448500-65100
A14PCW0069	5451591	4970502	21A14	448500-65100
A14PCW0070	5451553	4970568	21A14	448500-65100
A14PCW0071	5451567	4970537	21A14	448500-65100
A14PCW0072	5451513	4970626	21A14	448500-65100
A14PCW0073	5451439	4970709	21A14	448500-65100
A14PCW0074	5451373	4970777	21A14	448500-65100
A14PCW0075	5451337	4970825	21A14	448500-65100
A14PCW0076	5451334	4970889	21A14	448500-65100
A14PCW0077	5451268	4971033	21A14	448500-65100
A14PCW0077	5451329	4970981	21A14	448500-65100
A14PCW0078	5451239	4971053	21A14	448500-65100
A14PCW0079	5451196	4971131	21A14	448500-65100
A14PCW0079	5451217	4971087	21A14	448500-65100
A14PCW0080	5451189	4971143	21A14	448500-65100
A14PCW0081	5450239	4970195	21A14	448500-65100
A14PCW0082	5450258	4970155	21A14	448500-65100
A14PCW0083	5450288	4970100	21A14	448500-65100
A14PCW0084	5450297	4970092	21A14	448500-65100
A14PCW0085	5450303	4970081	21A14	448500-65100
A14PCW0086	5450311	4970070	21A14	448500-65100
A14PCW0087	5450325	4970047	21A14	448500-65100
A14PCW0088	5450354	4969967	21A14	448500-65100
A14PCW0089	5450369	4969930	21A14	448500-65100
A14PCW0090	5451398	4969325	21A14	448500-65100
A14PCW0091	5451373	4969379	21A14	448500-65100
A14PCW0092	5451307	4969461	21A14	448500-65100

**SILURIAN METALLOGENY PROJECT
OUTCROP STATION LOCATIONS**

STATION NUMBER	MTM		NTS	MTM
	EASTING	NORTHING	SHEET	SHEET
A14PCW0093	5451300	4969469	21A14	448500-65100
A14PCW0094	5451286	4969491	21A14	448500-65100
A14PCW0095	5451223	4969632	21A14	448500-65100
A14PCW0095	5451260	4969552	21A14	448500-65100
A14PCW0096	5451180	4969703	21A14	448500-65100
A14PCW0097	5451118	4969771	21A14	448500-65100
A14PCW0098	5451109	4969796	21A14	448500-65100
A14PCW0099	5451083	4969875	21A14	448500-65100
A14PCW0100	5451069	4969891	21A14	448500-65100
A14PCW0101	5451051	4969903	21A14	448500-65100
A14PCW0102	5451036	4969914	21A14	448500-65100
A14PCW0103	5450999	4969976	21A14	448500-65100
A14PCW0103	5451032	4969931	21A14	448500-65100
A14PCW0104	5450977	4969996	21A14	448500-65100
A14PCW0105	5450914	4970015	21A14	448500-65100
A14PCW0106	5450859	4970041	21A14	448500-65100
A14PCW0107	5450845	4970049	21A14	448500-65100
A14PCW0108	5450831	4970058	21A14	448500-65100
A14PCW0109	5450821	4970071	21A14	448500-65100
A14PCW0110	5450805	4970086	21A14	448500-65100
A14PCW0111	5450792	4970100	21A14	448500-65100
A14PCW0112	5450795	4970137	21A14	448500-65100
A14PCW0113	5450795	4970174	21A14	448500-65100
A14PCW0114	5450699	4970298	21A14	448500-65100
A14PCW0115	5450591	4970374	21A14	448500-65100
A14PCW0115	5450681	4970317	21A14	448500-65100
A14PCW0116	5450506	4970459	21A14	448500-65100
A14PCW0117	5450456	4970496	21A14	448500-65100
A14PCW0118	5450407	4970515	21A14	448500-65100
A14PCW0119	5450364	4970529	21A14	448500-65100
A14PCW0120	5450317	4970574	21A14	448500-65100
A14PCW0121	5450211	4970597	21A14	448500-65100
A14PCW0122	5450184	4970611	21A14	448500-65100
A14PCW0123	5454490	4970325	21A14	448500-65000
A14PCW0124	5454518	4970295	21A14	448500-65000
A14PCW0125	5454398	4970398	21A14	448500-65000
A14PCW0126	5454508	4970718	21A14	448500-65000
A14PCW0127	5454397	4970776	21A14	448500-65000
A14PCW0128	5453974	4971120	21A14	448500-65000
A14PCW0129	5453876	4971216	21A14	448500-65000
A14PCW0130	5453814	4971302	21A14	448500-65000
A14PCW0131	5453784	4971400	21A14	448500-65000
A14PCW0132	5453789	4971436	21A14	448500-65000
A14PCW0133	5453771	4971456	21A14	448500-65000
A14PCW0134	5453697	4971551	21A14	448500-65000
A14PCW0135	5453652	4971611	21A14	448500-65000
A14PCW0136	5453676	4971608	21A14	448500-65000
A14PCW0137	5453501	4971880	21A14	448500-65000
A14PCW0138	5453341	4972205	21A14	448500-65000

**SILURIAN METALLOGENY PROJECT
OUTCROP STATION LOCATIONS**

STATION NUMBER	MTM		NTS	MTM
	EASTING	NORTHING	SHEET	SHEET
A14PCW0139	5453327	4972222	21A14	448500-65000
A14PCW0140	5453320	4972244	21A14	448500-65000
A14PCW0141	5453320	4972260	21A14	448500-65000
A14PCW0142	5453581	4971987	21A14	448500-65000
A14PCW0142	5453588	4971982	21A14	448500-65000
A14PCW0143	5453719	4971702	21A14	448500-65000
A14PCW0144	5453421	4971399	21A14	448500-65000
A14PCW0146	5458388	4969297	21A14	448500-65000
A14PCW0146	5458407	4969297	21A14	448500-65000
A14PCW0147	5458559	4970409	21A14	448500-65000
A14PCW0148	5458572	4970427	21A14	448500-65000
A14PCW0149	5458656	4970544	21A14	448500-65000
A14PCW0150	5458638	4970519	21A14	448500-65000
A14PCW0151	5458627	4970503	21A14	448500-65000
A14PCW0152	5458607	4970477	21A14	448500-65000
A14PCW0153	5458588	4970443	21A14	448500-65000
A14PCW0154	5458806	4970766	21A14	448500-65000
A14PCW0155	5458815	4970795	21A14	448500-65000
A14PCW0156	5458934	4971235	21A14	448500-65000
A14PCW0157	5458937	4971268	21A14	448500-65000
A14PCW0158	5458931	4971390	21A14	448500-65000
A14PCW0159	5458941	4971470	21A14	448500-65000
A14PCW0160	5458951	4971494	21A14	448500-65000
A14PCW0161	5459106	4971809	21A14	448500-65000
A14PCW0162	5459108	4971779	21A14	448500-65000
A14PCW0163	5459108	4971752	21A14	448500-65000
A14PCW0164	5459106	4971738	21A14	448500-65000
A14PCW0165	5459072	4971919	21A14	448500-65000
A14PCW0166	5458401	4972043	21A14	448500-65000
A14PCW0167	5458385	4972050	21A14	448500-65000
A14PCW0168	5458333	4972016	21A14	448500-65000
A14PCW0169	5458211	4971844	21A14	448500-65000
A14PCW0170	5458221	4971819	21A14	448500-65000
A14PCW0171	5458256	4971929	21A14	448500-65000
A14PCW0172	5458240	4971851	21A14	448500-65000
A14PCW0173	5458260	4971900	21A14	448500-65000
A14PCW0174	5458340	4971995	21A14	448500-65000
A14PCW0175	5458469	4972080	21A14	448500-65000
A14PCW0176	5458513	4972099	21A14	448500-65000
A14PCW0177	5458555	4972114	21A14	448500-65000
A14PCW0178	5458665	4972164	21A14	448500-65000
A14PCW0179	5458680	4972196	21A14	448500-65000
A14PCW0180	5458672	4972214	21A14	448500-65000
A14PCW0181	5458662	4972301	21A14	448500-65000
A14PCW0182	5458668	4972373	21A14	448500-65000
A14PCW0183	5458678	4972502	21A14	448500-65000
A14PCW0184	5458807	4972967	21A14	448500-65000
A14PCW0185	5458810	4973000	21A14	448500-65000
A14PCW0186	5458816	4973030	21A14	448500-65000

**SILURIAN METALLOGENY PROJECT
OUTCROP STATION LOCATIONS**

STATION NUMBER	MTM		NTS SHEET	MTM SHEET
	EASTING	NORTHING		
A14PCW0187	5458717	4973287	21A14	448500-65000
A14PCW0188	5458398	4973386	21A14	448500-65000
A14PCW0189	5458309	4973460	21A14	448500-65000
A14PCW0190	5458275	4973507	21A14	449000-65000
A14PCW0191	5458196	4973666	21A14	449000-65000
A14PCW0192	5458200	4973650	21A14	449000-65000
A14PCW0193	5458210	4973651	21A14	449000-65000
A14PCW0194	5458242	4973819	21A14	449000-65000
A14PCW0195	5458184	4973784	21A14	449000-65000
A14PCW0196	5458189	4973765	21A14	449000-65000
A14PCW0197	5458184	4973731	21A14	449000-65000
A14PCW0198	5456836	4973395	21A14	448500-65000
A14PCW0199	5457379	4973512	21A14	449000-65000
A14PCW0200	5457541	4973481	21A14	449000-65000
A14PCW0202	5456718	4973324	21A14	448500-65000
A14PCW0203	5456660	4973265	21A14	448500-65000
A14PCW0204	5456633	4973238	21A14	448500-65000
A14PCW0205	5456568	4973133	21A14	448500-65000
A14PCW0206	5456499	4972987	21A14	448500-65000
A14PCW0207	5456480	4972993	21A14	448500-65000
A14PCW0208	5456480	4972964	21A14	448500-65000
A14PCW0209	5456457	4972959	21A14	448500-65000
A14PCW0210	5456421	4972920	21A14	448500-65000
A14PCW0211	5456343	4972878	21A14	448500-65000
A14PCW0212	5456309	4972768	21A14	448500-65000
A14PCW0213	5456313	4972751	21A14	448500-65000
A14PCW0214	5456345	4972704	21A14	448500-65000
A14PCW0215	5456356	4972669	21A14	448500-65000
A14PCW0216	5456366	4972648	21A14	448500-65000
A14PCW0217	5456083	4972324	21A14	448500-65000
A14PCW0218	5456090	4972278	21A14	448500-65000
A14PCW0219	5456093	4972237	21A14	448500-65000
A14PCW0220	5456090	4972205	21A14	448500-65000
A14PCW0221	5456088	4972122	21A14	448500-65000
A14PCW0222	5456071	4971841	21A14	448500-65000
A14PCW0223	5456051	4971793	21A14	448500-65000
A14PCW0224	5456052	4971766	21A14	448500-65000
A14PCW0225	5456078	4971674	21A14	448500-65000
A14PCW0226	5456084	4971647	21A14	448500-65000
A14PCW0227	5456107	4971490	21A14	448500-65000
A14PCW0228	5456103	4971425	21A14	448500-65000
A14PCW0229	5456123	4971351	21A14	448500-65000
A14PCW0230	5456126	4971316	21A14	448500-65000
A14PCW0231	5456142	4971175	21A14	448500-65000
A14PCW0232	5456171	4971130	21A14	448500-65000
A14PCW0233	5455907	4971101	21A14	448500-65000
A14PCW0234	5455798	4971166	21A14	448500-65000
A14PCW0235	5455647	4971165	21A14	448500-65000
A14PCW0236	5455669	4971285	21A14	448500-65000

**SILURIAN METALLOGENY PROJECT
OUTCROP STATION LOCATIONS**

STATION NUMBER	MTM		NTS	MTM
	EASTING	NORTHING	SHEET	SHEET
A14PCW0237	5455656	4971274	21A14	448500-65000
A14PCW0238	5455640	4971368	21A14	448500-65000
A14PCW0238	5455662	4971351	21A14	448500-65000
A14PCW0238	5455685	4971367	21A14	448500-65000
A14PCW0239	5455625	4971410	21A14	448500-65000
A14PCW0240	5455602	4971459	21A14	448500-65000
A14PCW0241	5455560	4971594	21A14	448500-65000
A14PCW0242	5455605	4971844	21A14	448500-65000
A14PCW0243	5455699	4971819	21A14	448500-65000
A14PCW0244	5455736	4971809	21A14	448500-65000
A14PCW0245	5455576	4971889	21A14	448500-65000
A14PCW0246	5455474	4972001	21A14	448500-65000
A14PCW0247	5455431	4972494	21A14	448500-65000
A14PCW0248	5455412	4972530	21A14	448500-65000
A14PCW0249	5455376	4972558	21A14	448500-65000
A14PCW0250	5455348	4972640	21A14	448500-65000
A14PCW0251	5455332	4972691	21A14	448500-65000
A14PCW0252	5455280	4972824	21A14	448500-65000
A14PCW0253	5455273	4972852	21A14	448500-65000
A14PCW0254	5455254	4972956	21A14	448500-65000
A14PCW0255	5455238	4972999	21A14	448500-65000
A14PCW0256	5455251	4973074	21A14	448500-65000
A14PCW0257	5455249	4973123	21A14	448500-65000
A14PCW0258	5456245	4972920	21A14	448500-65000
A14PCW0259	5457718	4973457	21A14	448500-65000
A14PCW0267	5455028	4968568	21A14	448500-65000
A14PCW0268	5455093	4968507	21A14	448500-65000
A14PCW0269	5454935	4968737	21A14	448500-65000
A14PCW0269	5454943	4968722	21A14	448500-65000
A14PCW0270	5454677	4968927	21A14	448500-65000
A14PCW0270	5454695	4968916	21A14	448500-65000
A14PCW0271	5454331	4969124	21A14	448500-65000
A14PCW0272	5454236	4969137	21A14	448500-65000
A14PCW0273	5454104	4969228	21A14	448500-65000
A14PCW0274	5454054	4969325	21A14	448500-65000
A14PCW0275	5453554	4969418	21A14	448500-65000
A14PCW0275	5453634	4969277	21A14	448500-65000
A14PCW0275	5453653	4969275	21A14	448500-65000
A14PCW0276	5457901	4971952	21A14	448500-65000
A14PCW0277	5457940	4971957	21A14	448500-65000
A14PCW0278	5457931	4972118	21A14	448500-65000
A14PCW0279	5457955	4972240	21A14	448500-65000
A14PCW0279	5457977	4972265	21A14	448500-65000
A14PCW0279	5457980	4972245	21A14	448500-65000
A14PCW0280	5457938	4972333	21A14	448500-65000
A14PCW0281	5457855	4972480	21A14	448500-65000
A14PCW0282	5457723	4972695	21A14	448500-65000
A14PCW0282	5457740	4972727	21A14	448500-65000
A14PCW0282	5457752	4972698	21A14	448500-65000

**SILURIAN METALLOGENY PROJECT
OUTCROP STATION LOCATIONS**

STATION NUMBER	MTM		NTS SHEET	MTM SHEET
	EASTING	NORTHING		
A14PCW0283	5457730	4972756	21A14	448500-65000
A14PCW0285	5457681	4972901	21A14	448500-65000
A14PCW0286	5457654	4972776	21A14	448500-65000
A14PCW0286	5457659	4972791	21A14	448500-65000
A14PCW0286	5457666	4972808	21A14	448500-65000
A14PCW0286	5457676	4972827	21A14	448500-65000
A14PCW0287	5457627	4973067	21A14	448500-65000
A14PCW0288	5457742	4973148	21A14	448500-65000
A14PCW0289	5457742	4973133	21A14	448500-65000
A14PCW0290	5457747	4973104	21A14	448500-65000
A14PCW0291	5457752	4973062	21A14	448500-65000
A14PCW0292	5457679	4973101	21A14	448500-65000
A14PCW0292	5457698	4973126	21A14	448500-65000
A14PCW0295	5460250	4973644	21A14	449000-65000
A14PCW0300	5457791	4968343	21A14	448500-65000
A14PCW0300	5457794	4968360	21A14	448500-65000
A14PCW0300	5457802	4968377	21A14	448500-65000
A14PCW0300	5457809	4968396	21A14	448500-65000
A14PCW0301	5457817	4968423	21A14	448500-65000
A14PCW0301	5457834	4968446	21A14	448500-65000
A14PCW0302	5458442	4970954	21A14	448500-65000
A14PCW0302	5458464	4970917	21A14	448500-65000
A14PCW0302	5458477	4970932	21A14	448500-65000
A14PCW0303	5458354	4971668	21A14	448500-65000
A14PCW0303	5458359	4971646	21A14	448500-65000
A14PCW0303	5458384	4971587	21A14	448500-65000
A14PCW0303	5458388	4971568	21A14	448500-65000
A14PCW0303	5458413	4971653	21A14	448500-65000
A14PCW0304	5458114	4971849	21A14	448500-65000
A14PCW0304	5458149	4971856	21A14	448500-65000
A14PCW0305	5458051	4972008	21A14	448500-65000
A14PCW0305	5458073	4972020	21A14	448500-65000
A14PCW0306	5458021	4972050	21A14	448500-65000
A14PCW0307	5458002	4972125	21A14	448500-65000
A14PCW0307	5458023	4972125	21A14	448500-65000
A14PCW0308	5458029	4972161	21A14	448500-65000
A15ABH0001	5465946	4976411	21A15	449000-64900
A15ABH0001	5465953	4976434	21A15	449000-64900
A15ABH0001	5465954	4976465	21A15	449000-64900
A15ABH0001	5465966	4976511	21A15	449000-64900
A15ABH0001	5465981	4976511	21A15	449000-64900
A15ABH0002	5466098	4976717	21A15	449000-64900
A15ABH0002	5466114	4976738	21A15	449000-64900
A15ABH0002	5466121	4976763	21A15	449000-64900
A15ABH0003	5466132	4976793	21A15	449000-64900
A15ABH0003	5466136	4976839	21A15	449000-64900
A15ABH0004	5466159	4976901	21A15	449000-64900
A15ABH0005	5466169	4976934	21A15	449000-64900
A15ABH0006	5466169	4976963	21A15	449000-64900

**SILURIAN METALLOGENY PROJECT
OUTCROP STATION LOCATIONS**

STATION NUMBER	MTM		NTS	MTM
	EASTING	NORTHING	SHEET	SHEET
A15ABH0007	5466114	4977081	21A15	449000-64900
A15ABH0007	5466136	4977060	21A15	449000-64900
A15ABH0007	5466154	4977038	21A15	449000-64900
A15ABH0008	5466060	4977320	21A15	449000-64900
A15ABH0008	5466075	4977297	21A15	449000-64900
A15ABH0008	5466080	4977269	21A15	449000-64900
A15ABH0009	5466035	4977384	21A15	449000-64900
A15ABH0009	5466045	4977349	21A15	449000-64900
A15ABH0010	5466001	4977450	21A15	449000-64900
A15ABH0011	5465994	4977527	21A15	449000-64900
A15ABH0012	5465979	4977553	21A15	449000-64900
A15ABH0013	5465908	4976248	21A15	449000-64900
A15ABH0014	5465992	4976123	21A15	449000-64900
A15ABH0015	5466005	4976108	21A15	449000-64900
A15ABH0016	5466024	4976081	21A15	449000-64900
A15ABH0017	5466193	4975915	21A15	449000-64900
A15ABH0018	5466223	4975849	21A15	449000-64900
A15ABH0019	5466202	4975765	21A15	449000-64900
A15ABH0020	5469375	4978624	21A15	449000-64800
A15ABH0021	5468972	4978131	21A15	449000-64800
A15ABH0022	5468974	4978134	21A15	449000-64800
A15ABH0023	5468836	4977957	21A15	449000-64800
A15ABH0024	5468804	4977910	21A15	449000-64800
A15ABH0025	5468794	4977897	21A15	449000-64800
A15ABH0026	5468793	4977853	21A15	449000-64800
A15ABH0027	5468795	4977823	21A15	449000-64800
A15ABH0028	5468803	4977788	21A15	449000-64800
A15ABH0029	5468864	4977745	21A15	449000-64800
A15ABH0030	5468737	4977445	21A15	449000-64800
A15ABH0031	5468785	4977265	21A15	449000-64800
A15ABH0032	5468734	4977220	21A15	449000-64800
A15ABH0033	5468489	4977010	21A15	449000-64800
A15ABH0034	5468354	4976654	21A15	449000-64900
A15ABH0034	5468377	4976696	21A15	449000-64900
A15ABH0034	5468393	4976738	21A15	449000-64900
A15ABH0034	5468412	4976750	21A15	449000-64900
A15ABH0035	5468336	4976209	21A15	449000-64900
A15ABH0036	5468315	4976175	21A15	449000-64900
A15ABH0037	5468252	4976036	21A15	449000-64900
A15ABH0037	5468256	4976010	21A15	449000-64900
A15ABH0037	5468270	4975993	21A15	449000-64900
A15ABH0037	5468287	4975964	21A15	449000-64900
A15ABH0110	5464021	4972519	21A15	448500-64900
A15ABH0111	5462787	4971734	21A15	448500-64900
A15ABH0112	5462486	4971358	21A15	448500-64900
A15ABH0113	5462493	4971361	21A15	448500-64900
A15ABH0114	5466616	4978125	21A15	449000-64900
A15ABH0115	5466599	4978159	21A15	449000-64900
A15ABH0116	5466636	4978079	21A15	449000-64900

**SILURIAN METALLOGENY PROJECT
OUTCROP STATION LOCATIONS**

STATION NUMBER	MTM		NTS SHEET	MTM SHEET
	EASTING	NORTHING		
A15ABH0117	5466645	4978060	21A15	449000-64900
A15ABH0118	5466655	4978038	21A15	449000-64900
A15ABH0119	5466674	4977995	21A15	449000-64900
A15MPC0001	5469118	4978975	21A15	449500-64800
A15MPC0002	5469161	4978953	21A15	449000-64800
A15MPC0003	5469205	4978957	21A15	449000-64800
A15MPC0004	5469264	4978941	21A15	449000-64800
A15MPC0005	5469289	4978916	21A15	449000-64800
A15MPC0006	5469313	4978902	21A15	449000-64800
A15MPC0007	5469348	4978890	21A15	449000-64800
A15MPC0008	5469390	4978880	21A15	449000-64800
A15MPC0008	5469411	4978885	21A15	449000-64800
A15MPC0009		4978880	21A15	449000-64800
A15MPC0010	5469065	4979016	21A15	449500-64800
A15MPC0011	5469057	4979065	21A15	449500-64800
A15MPC0012	5469061	4979097	21A15	449500-64800
A15MPC0013	5469000	4979114	21A15	449500-64800
A15MPC0014	5468962	4979114	21A15	449500-64800
A15MPC0015	5468928	4979105	21A15	449500-64800
A15MPC0016	5468883	4979106	21A15	449500-64800
A15MPC0017	5468770	4979128	21A15	449500-64800
A15MPC0018	5468749	4979137	21A15	449500-64800
A15MPC0019	5468673	4979179	21A15	449500-64800
A15MPC0019	5468691	4979165	21A15	449500-64800
A15MPC0020	5468530	4979263	21A15	449500-64800
A15MPC0021	5468488	4979357	21A15	449500-64800
A15MPC0021	5468491	4979378	21A15	449500-64800
A15MPC0022	5468537	4979508	21A15	449500-64800
A15MPC0023	5468456	4979882	21A15	449500-64800
A15MPC0023	5468407	4979900	21A15	449500-64900
A15MPC0024	5468300	4979878	21A15	449500-64900
A15MPC0025	5468670	4978736	21A15	449000-64800
A15MPC0025	5468684	4978748	21A15	449000-64800
A15MPC0025	5468324	4979952	21A15	449500-64900
A15MPC0025	5468344	4979974	21A15	449500-64900
A15MPC0027	5464934	4975727	21A15	449000-64900
A15MPC0028	5464853	4975775	21A15	449000-64900
A15MPC0028	5464860	4975769	21A15	449000-64900
A15MPC0030	5464810	4975808	21A15	449000-64900
A15MPC0031	5464766	4975828	21A15	449000-64900
A15MPC0032	5464732	4975854	21A15	449000-64900
A15MPC0033	5464718	4975863	21A15	449000-64900
A15MPC0034	5464654	4975940	21A15	449000-64900
A15MPC0035	5464615	4976008	21A15	449000-64900
A15MPC0036	5464604	4976026	21A15	449000-64900
A15MPC0037	5464557	4976113	21A15	449000-64900
A15MPC0038	5464544	4976137	21A15	449000-64900
A15MPC0039	5464463	4976201	21A15	449000-64900
A15MPC0039	5464477	4976185	21A15	449000-64900

**SILURIAN METALLOGENY PROJECT
OUTCROP STATION LOCATIONS**

STATION NUMBER	MTM		NTS SHEET	MTM SHEET
	EASTING	NORTHING		
A15MPC0040	5464446	4976256	21A15	449000-64900
A15MPC0041	5464442	4976283	21A15	449000-64900
A15MPC0041	5464443	4976292	21A15	449000-64900
A15MPC0042	5464439	4976340	21A15	449000-64900
A15MPC0043	5464389	4976390	21A15	449000-64900
A15MPC0044	5464364	4976426	21A15	449000-64900
A15MPC0045	5464358	4976443	21A15	449000-64900
A15MPC0046	5464355	4976450	21A15	449000-64900
A15MPC0047	5464327	4976484	21A15	449000-64900
A15MPC0048	5464244	4976539	21A15	449000-64900
A15MPC0049	5464956	4975703	21A15	449000-64900
A15MPC0050	5464998	4975645	21A15	449000-64900
A15MPC0051	5465023	4975603	21A15	449000-64900
A15MPC0074	5461756	4973603	21A15	449000-64900
A15MPC0074	5461783	4973629	21A15	449000-64900
A15MPC0074	5461875	4973692	21A15	449000-64900
A15MPC0074	5461897	4973721	21A15	449000-64900
A15MPC0075	5461832	4973442	21A15	448500-64900
A15MPC0075	5461775	4973524	21A15	449000-64900
A15MPC0076	5462009	4973290	21A15	448500-64900
A15MPC0077	5462134	4973019	21A15	448500-64900
A15MPC0078	5462134	4972591	21A15	448500-64900
A15MPC0079	5462169	4972504	21A15	448500-64900
A15MPC0080	5462437	4971829	21A15	448500-64900
A15MPC0082	5464979	4974689	21A15	449000-64900
A15MPC0082	5465083	4974700	21A15	449000-64900
A15MPC0082	5465083	4974802	21A15	449000-64900
A15MPC0082	5465111	4974777	21A15	449000-64900
A15MPC0082	5465117	4974743	21A15	449000-64900
A15MPC0083	5465142	4974391	21A15	449000-64900
A15MPC0084	5465221	4974158	21A15	449000-64900
A15MPC0085	5465280	4974032	21A15	449000-64900
A15MPC0085	5465291	4973976	21A15	449000-64900
A15MPC0086	5465344	4973849	21A15	449000-64900
A15MPC0087	5465444	4973719	21A15	449000-64900
A15MPC0088	5464753	4972580	21A15	448500-64900
A15MPC0088	5464753	4972623	21A15	448500-64900
A15MPC0088	5464811	4972555	21A15	448500-64900
A15MPC0089	5464911	4972417	21A15	448500-64900
A15MPC0090	5464829	4972257	21A15	448500-64900
A15MPC0091	5464699	4972013	21A15	448500-64900
A15MPC0092	5464603	4971781	21A15	448500-64900
A15MPC0093	5464615	4971552	21A15	448500-64900
A15MPC0093	5464623	4971621	21A15	448500-64900
A15MPC0094	5464783	4971234	21A15	448500-64900
A15MPC0095	5464862	4971023	21A15	448500-64900
A15MPC0096	5465497	4970699	21A15	448500-64900
A15MPC0100	5469473	4978841	21A15	449000-64800
A15MPC0100	5469474	4978827	21A15	449000-64800

**SILURIAN METALLOGENY PROJECT
OUTCROP STATION LOCATIONS**

STATION NUMBER	MTM		NTS	MTM
	EASTING	NORTHING	SHEET	SHEET
A15MPC0101	5469457	4978755	21A15	449000-64800
A15MPC0102	5469413	4978701	21A15	449000-64800
A15MPC0103	5469388	4978642	21A15	449000-64800
A15MPC0103	5469395	4978628	21A15	449000-64800
A15MPC0104	5469485	4978537	21A15	449000-64800
A15MPC0105	5469515	4978507	21A15	449000-64800
A15MPC0106	5469525	4978449	21A15	449000-64800
A15MPC0107	5469494	4978414	21A15	449000-64800
A15MPC0108	5469488	4978379	21A15	449000-64800
A15MPC0109	5469516	4978320	21A15	449000-64800
A15MPC0110	5469590	4978288	21A15	449000-64800
A15MPC0111	5469686	4978220	21A15	449000-64800
A15MPC0112	5469747	4978166	21A15	449000-64800
A15MPC0113	5461154	4971190	21A15	448500-64900
A15MPC0114	5461156	4971202	21A15	448500-64900
A15MPC0115	5461328	4971694	21A15	448500-64900
A15MPC0116	5461341	4971753	21A15	448500-64900
A15MPC0117	5461347	4971848	21A15	448500-64900
A15MPC0118	5461350	4971902	21A15	448500-64900
A15MPC0119	5461306	4972000	21A15	448500-64900
A15MPC0120	5461293	4972070	21A15	448500-64900
A15MPC0121	5461249	4972190	21A15	448500-64900
A15MPC0122	5461241	4972236	21A15	448500-64900
A15MPC0123	5461143	4972455	21A15	448500-64900
A15MPC0124	5461124	4972507	21A15	448500-64900
A15MPC0125	5461119	4972564	21A15	448500-64900
A15MPC0126	5461081	4972626	21A15	448500-64900
A15MPC0127	5461046	4972707	21A15	448500-64900
A15MPC0128	5461051	4973260	21A15	448500-64900
A15MPC0129	5461130	4973282	21A15	448500-64900
A15MPC0130	5461209	4973323	21A15	448500-64900
A15MPC0131	5461154	4973803	21A15	449000-64900
A15MPC0131	5461177	4973786	21A15	449000-64900
A15MPC0132	5461035	4973866	21A15	449000-64900
A15MPC0133	5461114	4973976	21A15	449000-64900
A15MPC0134	5461110	4974080	21A15	449000-64900
A15MPC0135	5461088	4974150	21A15	449000-64900
A15MPC0135	5461115	4974177	21A15	449000-64900
A15MPC0136	5461154	4971024	21A15	448500-64900
A15MPC0137	5461190	4970959	21A15	448500-64900
A15MPC0138	5461233	4970859	21A15	448500-64900
A15MPC0139	5461263	4970832	21A15	448500-64900
A15MPC0140	5461295	4970794	21A15	448500-64900
A15MPC0141	5461312	4970740	21A15	448500-64900
A15MPC0142	5461379	4970721	21A15	448500-64900
A15MPC0143	5461496	4970704	21A15	448500-64900
A15MPC0144	5461586	4970637	21A15	448500-64900
A15MPC0145	5461605	4970607	21A15	448500-64900
A15MPC0146	5461648	4970455	21A15	448500-64900

**SILURIAN METALLOGENY PROJECT
OUTCROP STATION LOCATIONS**

STATION NUMBER	MTM		NTS	MTM
	EASTING	NORTHING	SHEET	SHEET
A15MPC0147	5461648	4970417	21A15	448500-64900
A15MPC0148	5461648	4970311	21A15	448500-64900
A15MPC0149	5461643	4970271	21A15	448500-64900
A15MPC0150	5461702	4970111	21A15	448500-64900
A15MPC0151	5461770	4970108	21A15	448500-64900
A15MPC0152	5461794	4970086	21A15	448500-64900
A15MPC0153	5461716	4969850	21A15	448500-64900
A15MPC0154	5461697	4969617	21A15	448500-64900
A15MPC0155	5461672	4969566	21A15	448500-64900
A15MPC0156	5461550	4969460	21A15	448500-64900
A15MPC0157	5461588	4969395	21A15	448500-64900
A15MPC0158	5461716	4969327	21A15	448500-64900
A15MPC0159	5461721	4969249	21A15	448500-64900
A15MPC0160	5461784	4971238	21A15	448500-64900
A15MPC0161	5461930	4971084	21A15	448500-64900
A15MPC0161	5462009	4971030	21A15	448500-64900
A15MPC0162	5462115	4970962	21A15	448500-64900
A15MPC0163	5462161	4970961	21A15	448500-64900
A15MPC0163	5462169	4970966	21A15	448500-64900
A15MPC0164	5462238	4970998	21A15	448500-64900
A15MPC0165	5462341	4971059	21A15	448500-64900
A15MPC0166	5462392	4971099	21A15	448500-64900
A15MPC0167	5462467	4971258	21A15	448500-64900
A15MPC0167	5462468	4971283	21A15	448500-64900
A15MPC0167	5462469	4971271	21A15	448500-64900
A15MPC0167	5462470	4971295	21A15	448500-64900
A15MPC0167	5462486	4971302	21A15	448500-64900
A15MPC0168	5461667	4971539	21A15	448500-64900
A15MPC0169	5461843	4971656	21A15	448500-64900
A15MPC0170	5477710	4983153	21A15	449500-64700
A15MPC0171	5477697	4983155	21A15	449500-64700
A15MPC0172	5477677	4983182	21A15	449500-64700
A15MPC0173	5477663	4983224	21A15	449500-64700
A15MPC0174	5477669	4983235	21A15	449500-64700
A15MPC0175	5477672	4983267	21A15	449500-64700
A15MPC0176	5477629	4983289	21A15	449500-64700
A15MPC0177	5477608	4983349	21A15	449500-64700
A15MPC0178	5477618	4983385	21A15	449500-64700
A15MPC0179	5477643	4983434	21A15	449500-64700
A15MPC0180	5477659	4983456	21A15	449500-64700
A15MPC0181	5477644	4983490	21A15	449500-64700
A15MPC0182	5477607	4983539	21A15	449500-64700
A15MPC0183	5477622	4983593	21A15	449500-64700
A15MPC0184	5477609	4983643	21A15	449500-64700
A15MPC0185	5477571	4983683	21A15	449500-64700
A15MPC0186	5477545	4983729	21A15	449500-64700
A15MPC0187	5477523	4983769	21A15	449500-64700
A15MPC0188	5477428	4983755	21A15	449500-64700
A15MPC0189	5477420	4983791	21A15	449500-64700

SILURIAN METALLOGENY PROJECT
OUTCROP STATION LOCATIONS

STATION NUMBER	MTM		NTS	MTM
	EASTING	NORTHING	SHEET	SHEET
A15MPC0190	5477443	4983957	21A15	449500-64700
A15MPC0191	5477103	4984104	21A15	449500-64700
A15MPC0192	5477028	4984060	21A15	449500-64700
A15MPC0193	5476971	4983961	21A15	449500-64700
A15MPC0194	5476856	4983938	21A15	449500-64700
A15MPC0195	5476793	4983962	21A15	449500-64700
A15MPC0196	5476784	4984038	21A15	449500-64700
A15MPC0201	5477756	4983009	21A15	449500-64700
A15MPC0202	5477847	4982935	21A15	449500-64700
A15MPC0202	5477866	4982911	21A15	449500-64700
A15MPC0203	5477861	4982844	21A15	449500-64700
A15MPC0204	5477862	4982796	21A15	449500-64700
A15MPC0205	5477763	4982697	21A15	449500-64700
A15MPC0206	5477653	4982434	21A15	449500-64700
A15MPC0206	5477637	4982421	21A15	449500-64700
A15MPC0206	5477612	4982402	21A15	449500-64700
A15MPC0207	5477539	4982389	21A15	449500-64700
A15MPC0207	5477517	4982384	21A15	449500-64700
A15MPC0208	5477435	4982377	21A15	449500-64700
A15MPC0209	5477432	4982312	21A15	449500-64700
A15MPC0209	5477405	4982301	21A15	449500-64700
A15MPC0209	5477377	4982291	21A15	449500-64700
A15MPC0209	5477358	4982274	21A15	449500-64700
A15MPC0210	5477296	4982296	21A15	449500-64700
A15MPC0211	5477230	4982258	21A15	449500-64700
A15MPC0212	5477182	4982227	21A15	449500-64700
A15MPC0213	5477145	4982196	21A15	449500-64700
A15MPC0214	5477135	4982150	21A15	449500-64700
A15MPC0215	5477282	4981991	21A15	449500-64700
A15MPC0216	5477331	4981940	21A15	449500-64700
A15MPC0217	5477308	4981867	21A15	449500-64700
A15MPC0217	5477293	4981865	21A15	449500-64700
A15MPC0218	5477237	4981651	21A15	449500-64700
A15MPC0219	5474532	4982769	21A15	449500-64800
A15MPC0219	5474516	4982807	21A15	449500-64800
A15MPC0219	5474551	4982728	21A15	449500-64800
A15MPC0219	5474487	4982686	21A15	449500-64800
A15MPC0219	5474402	4982633	21A15	449500-64800
A15MPC0219	5474649	4982772	21A15	449500-64800
A15MPC0220	5475026	4982971	21A15	449500-64800
A15MPC0220	5475045	4982943	21A15	449500-64800
A15MPC0220	5475064	4982911	21A15	449500-64800
A15MPC0221	5478408	4981359	21a15	449500-64700
A15PCW0002	5463698	4977560	21A15	449000-64900
A15PCW0003	5463955	4973480	21A15	449000-64900
A15PCW0004	5463881	4973613	21A15	449000-64900
A15PCW0005	5463872	4973628	21A15	449000-64900
A15PCW0006	5463605	4973889	21A15	449000-64900
A15PCW0006	5462155	4972521	21A15	448500-64900

SILURIAN METALLOGENY PROJECT
OUTCROP STATION LOCATIONS

STATION NUMBER	MTM		NTS SHEET	MTM SHEET
	EASTING	NORTHING		
A15PCW0007	5461666	4972042	21A15	448500-64900
A15PCW0008	5461654	4972050	21A15	448500-64900
A15PCW0009	5461642	4972058	21A15	448500-64900
A15PCW0010	5461590	4972080	21A15	448500-64900
A15PCW0011	5461559	4972095	21A15	448500-64900
A15PCW0012	5461495	4972137	21A15	448500-64900
A15PCW0013	5461392	4972217	21A15	448500-64900
A15PCW0014	5461369	4972229	21A15	448500-64900
A15PCW0015	5461351	4972231	21A15	448500-64900
A15PCW0017	5465950	4977849	21A15	449000-64900
A15PCW0018	5466063	4977737	21A15	449000-64900
A15PCW0019	5466093	4977716	21A15	449000-64900
A15PCW0020	5466110	4977671	21A15	449000-64900
A15PCW0021	5466144	4977626	21A15	449000-64900
A15PCW0022	5469023	4978988	21A15	449500-64800
A15PCW0022	5469034	4978991	21A15	449500-64800
A15PCW0023	5471474	4978963	21A15	449500-64800
A15PCW0024	5471539	4978807	21A15	449000-64800
A15PCW0025	5471569	4978740	21A15	449000-64800
A15PCW0026	5471384	4978317	21A15	449000-64800
A15PCW0027	5471482	4978291	21A15	449000-64800
A15PCW0028	5471434	4978339	21A15	449000-64800
A15PCW0029	5471445	4978338	21A15	449000-64800
A15PCW0030	5472855	4980400	21A15	449500-64800
A15PCW0031	5472924	4980250	21A15	449500-64800
A15PCW0032	5472972	4980153	21A15	449500-64800
A15PCW0033	5472995	4980103	21A15	449500-64800
A15PCW0034	5473175	4981031	21A15	449500-64800
A15PCW0035	5474253	4981459	21A15	449500-64800
A15PCW0036	5474326	4981287	21A15	449500-64800
A15PCW0037	5474337	4981258	21A15	449500-64800
A15PCW0038	5474403	4981104	21A15	449500-64800
A15PCW0039	5474689	4980491	21A15	449500-64800
A15PCW0040	5474954	4979958	21A15	449500-64800
A15PCW0041	5475122	4979518	21A15	449500-64800
A15PCW0041	5475179	4979457	21A15	449500-64800
A15PCW0042	5475268	4979219	21A15	449500-64800
A15PCW0043	5475230	4979412	21A15	449500-64800
A15PCW0046	5467573	4976960	21A15	449000-64900
A15PCW0047	5461546	4972100	21A15	449000-64900
A15PCW0048	5463647	4973906	21A15	449000-64900
A15PCW0049	5458212	4974342	21A15	449000-65000
A15PCW0049	5458573	4973823	21A15	449000-65000
A15PCW0050	5458773	4973606	21A15	449000-65000
A15PCW0050	5458796	4973601	21A15	449000-65000
A15PCW0051	5471206	4980660	21A15	449500-64800
A15PCW0052	5473353	4981126	21A15	449500-64800
A15PCW0053	5473187	4981609	21A15	449500-64800
A15PCW0053	5473191	4981622	21A15	449500-64800

**SILURIAN METALLOGENY PROJECT
OUTCROP STATION LOCATIONS**

STATION NUMBER	MTM		NTS	MTM
	EASTING	NORTHING	SHEET	SHEET
A15PCW0054	5473188	4981776	21A15	449500-64800
A15PCW0054	5473220	4981765	21A15	449500-64800
A15PCW0055	5473345	4981841	21A15	449500-64800
A15PCW0056	5473460	4981790	21A15	449500-64800
A15PCW0057	5473459	4981816	21A15	449500-64800
A15PCW0058	5473456	4981836	21A15	449500-64800
A15PCW0059	5473035	4980004	21A15	449500-64800
A15PCW0060	5473044	4979982	21A15	449500-64800
A15PCW0061	5473124	4979805	21A15	449500-64800
A15PCW0062	5473172	4979706	21A15	449500-64800
A15PCW0063	5473341	4979328	21A15	449500-64800
A15PCW0296	5460897	4975622	21A15	449000-64900
A15PCW0297	5460955	4975554	21A15	449000-64900
A15PCW0297	5460942	4975539	21A15	449000-64900
A15PCW0298	5461040	4975265	21A15	449000-64900
A15PCW0299	5461384	4975111	21A15	449000-64900

SILURIAN METALLOGENY PROJECT
Lawrencetown to Morristown Area
Annapolis and Kings County,
Nova Scotia

NTS 21A14, 21A15
RFP 3 1993-000591

VOLUME II - GEOLOGICAL MAPS

OFR 96-010

M. Cullen, P. Webster, B. Hudgins

May, 1996

SILURIAN METALLOGENY PROJECT
Lawrencetown to Morristown Area
Annapolis and Kings County,
Nova Scotia

NTS 21A14, 21A15
RFP 3 1993-000591

VOLUME II - GEOLOGICAL MAPS

OFR 96-010

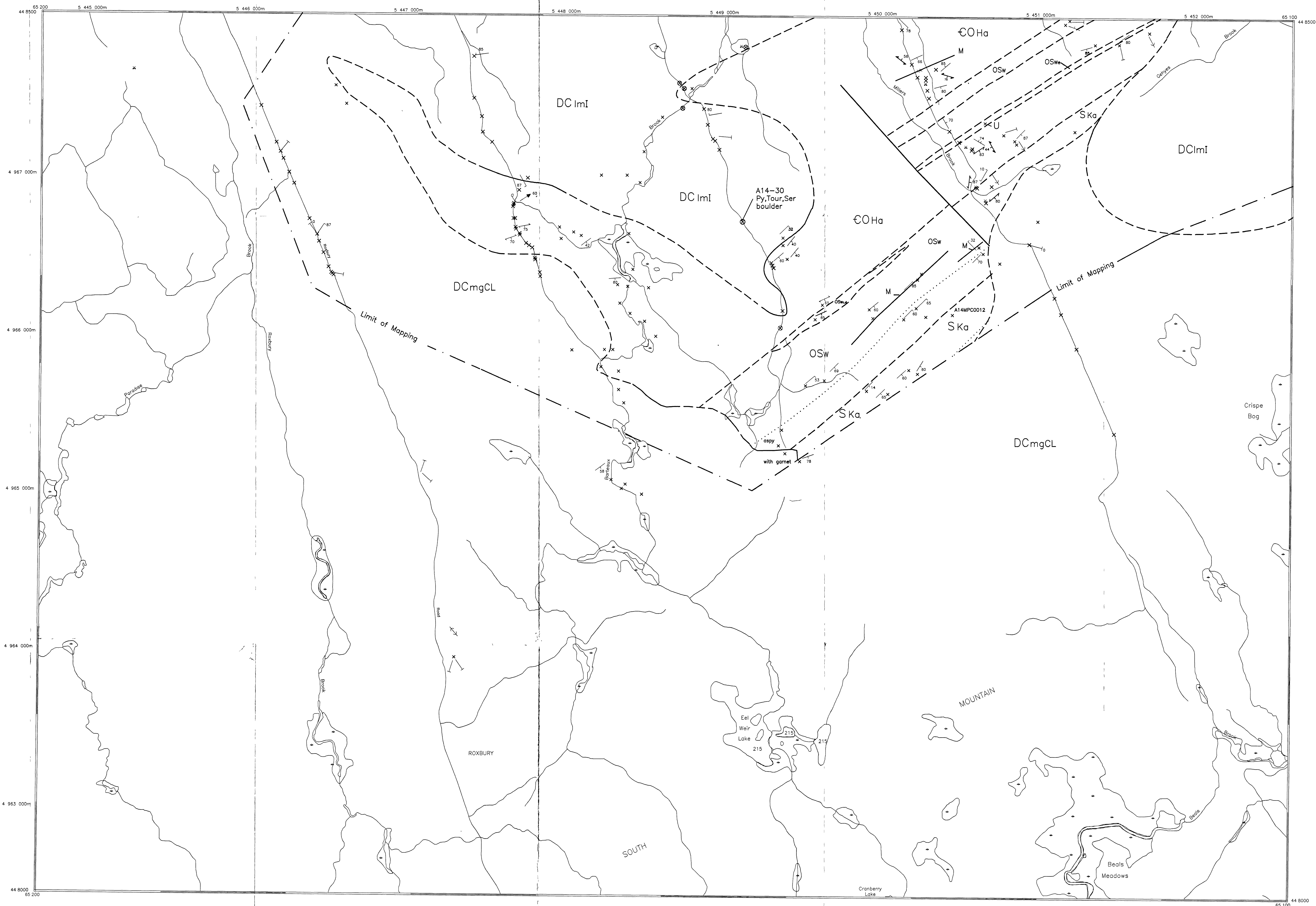
M. Cullen, P. Webster, B. Hudgins

May, 1996

VOLUME II GEOLOGICAL MAPS

1:10,000 Scale Project Geology Maps : 3⁰ MTM Projection

Map # 44 8000 - 65100	in pocket
Map # 44 8500 - 65100	in pocket
Map # 44 8000 - 65000	in pocket
Map # 44 8500 - 65000	in pocket
Map # 44 9000 - 65000	in pocket
Map # 44 8500 - 64900	in pocket
Map # 449000 - 64900	in pocket
Map # 449500 - 64900	in pocket
Map # 449500 - 64800	in pocket
Map # 449000 - 64800	in pocket
Map # 449500 - 64700	in pocket



GEOLOGICAL LEGEND

INTRUSIVE ROCKS

DEVONIAN

DC Middle to Upper Devonian

DC South Mountain Batholith: includes granodiorite, monzonite, granite, leucogranite

DCim Inglewille Leucogranite: buff, white to pink or orange, equigranular to megacrystic, 3-13% muscovite, 2-7% biotite

DCmg Cloud Lake Monzonite: light to medium grey, slightly megacrystic, 12-15% biotite, trace muscovite

DCgs Sog Lake Granodiorite: light to medium grey, fine to coarse grain locally megacrystic, 10-15% biotite, trace muscovite

DCg Granodiorite and undivided granitoid phases

M Gabbro and diabase sills and dikes; age range of pre Upper Silurian to post Upper Devonian

STRATIFIED ROCKS

TRIASSIC

TW WOLFVILLE FORMATION: predominantly reddish brown to pale grey arkosic sandstone and minor pebbly arkose and shale

Lower Devonian

Dr TORBROOK FORMATION: a) predominantly thinly bedded grey to brown quartz arenite near base, locally coarsening b) medium to dark grey, finely bedded siliceous and/or calcareous or phosphatic siltstone and grey to black silty limestone; locally fossiliferous; c) bedded quartzitic iron deposits with magnetite and/or hematite; locally oolitic and/or coquinitic d) dark grey to black siliceous siltstone and associated heterolithic volcanogenic conglomerate or breccia e) thinly interbedded red quartz arenite, sandy siltstone and shale with frequent grey interbeds; fossiliferous to coquinitic locally

SILURIAN

Upper Silurian

Sk KENTVILLE FORMATION: a) fine grained, thinly laminated to thin bedded, medium to dark grey or black siltstone and slate with minor interbedded quartz wacke; b) dark grey to black graphitic shale and infrequent volcanogenic siltstone or tuff interbeds near Torbrook Formation contact

Upper Silurian or Earlier

OSW WHITE ROCK FORMATION:

Upper Member: a) fine grained massive to thickly bedded quartz arenite plus interbedded dark grey and red, thinly bedded to laminated siliceous siltstone and sandy shale; locally with very thin volcanogenic wacke or tuff interbeds; equivalent to "Double Quartzite" unit of Smitheringale, (1973)

Lower Member: b) light grey green, medium to thick bedded quartz arenites with interbedded grey shale; finely laminated siltstone and lesser hematitic equivalents c) mafic volcanics: dark grey green to black pillow lava thin massive flows, local pillow breccia, tuff, lapilli tuff, chert and/or siliceous, calcareous mudstone and hydrothermal; d) felsic volcanics: light tan to grey, thinly bedded to massive ash, crystal tuff, welded tuff and infrequent thin flows; e) dark grey to black siliceous siltstone and associated heterolithic volcanogenic conglomerate or breccia; locally contains felsic tuff, rhyolite, mafic volcanic, diorite ? and siliceous siltstone fragments f) massively bedded quartz arenite (similar to Upper Member)

ORDOVICIAN

MEGUMA GROUP

COH HALIFAX FORMATION: a) medium to dark grey, thinly bedded to laminated siltstone and slate with sandy siltstone and very fine arenaceous laminae b) spotted slate to hornfels c) hornfels with local paragneissic banding at granite contacts d) pyritic siltstone and slate

COG GOLDENVILLE FORMATION: quartzite; minor slate (Not mapped in Study Area)

SYMBOLS

Geological Boundaries

defined

approximate

assumed

interpreted from aeromagnetics

anticline (defined, assumed)

syncline (defined, assumed)

approximate hornfels zone limit

approximate hematite zone limit

limit of mapping

trench, shaft

mine, quarry

diamond drill hole, report reference number

mineral occurrence, reference number

outcrop, sample number

outcrop, area

boulders, float

fault defined, approximate

fossil location

bedding: facing

inclined, vertical

layering: in lavas, tuffs, inclined, vertical

pillowed flows: facing unknown, inclined, vertical

pillowed flows: facing known, inclined, vertical

S1 cleavage or foliation

inclined, vertical

S1 cleavage or foliation

inclined, vertical

shear: dextral, sinistral

inclined, vertical

intersection lineation: S0/S1

plunge indicated: S0/S1

dike: inclined, vertical

joint: inclined, vertical

quartz vein: inclined, vertical

F1 fold axis: s, z, m

F2 fold axis: crenulation axis: s, z, m

plunge indicated

glacial striae: direction known, unknown

Abbreviations

Py	pyrite	Sul	sulphide
Po	pyrrhotite	Qz	quartz vein
Hem	hematite	Cu	copper
Cpy	chalcocite	U	uranium
Gn	galena	Ba	barium
Feld	feldspar	Zn	zinc
Mog	magnetite	As	arsenic
Tou	tourmaline	Au	gold
Bio	biotite	Mo	molybdenite
Musc	muscovite	W	wolframite
Ep	epidote	Bl	blende
Chl	chlorite	Co	cobalt
Apy	arsenopyrite	Fe	iron
Qtz	quartz	Mn	manganese
Bx	brecciation	Si	silicification
Ser	sericite	Ag	lead

South Mountain Batholith nomenclature from Ham and MacDonald, 1992.

NOTE See Report Page 4, Figure 2 For Inferred Stratigraphic Order of Lithologic Subunits

REFERENCES

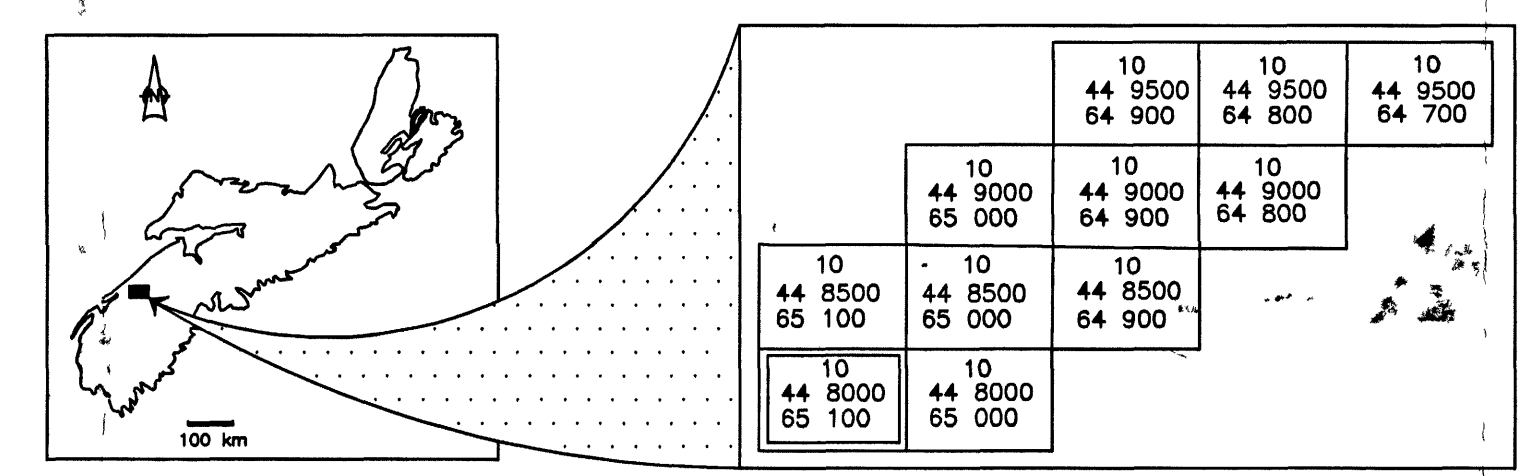
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WRIGHT, J.D. 1975. Iron Deposits of Nova Scotia. Nova Scotia Dept. of Natural Resources, Economic Geology Series 75-1.



Grid North at Centre of Sheet 0° 23' 3"

Magnetic Declination in 1987 20° 39'

Primary Reference Grid Nova Scotia 3° M.T.M.

Projected Base on Average Terrestrial System 1977 Datum

NOVA SCOTIA DEPARTMENT OF NATURAL RESOURCES

Sheet 44 8000 65 100

SILURIAN METALLOGENIC PROJECT

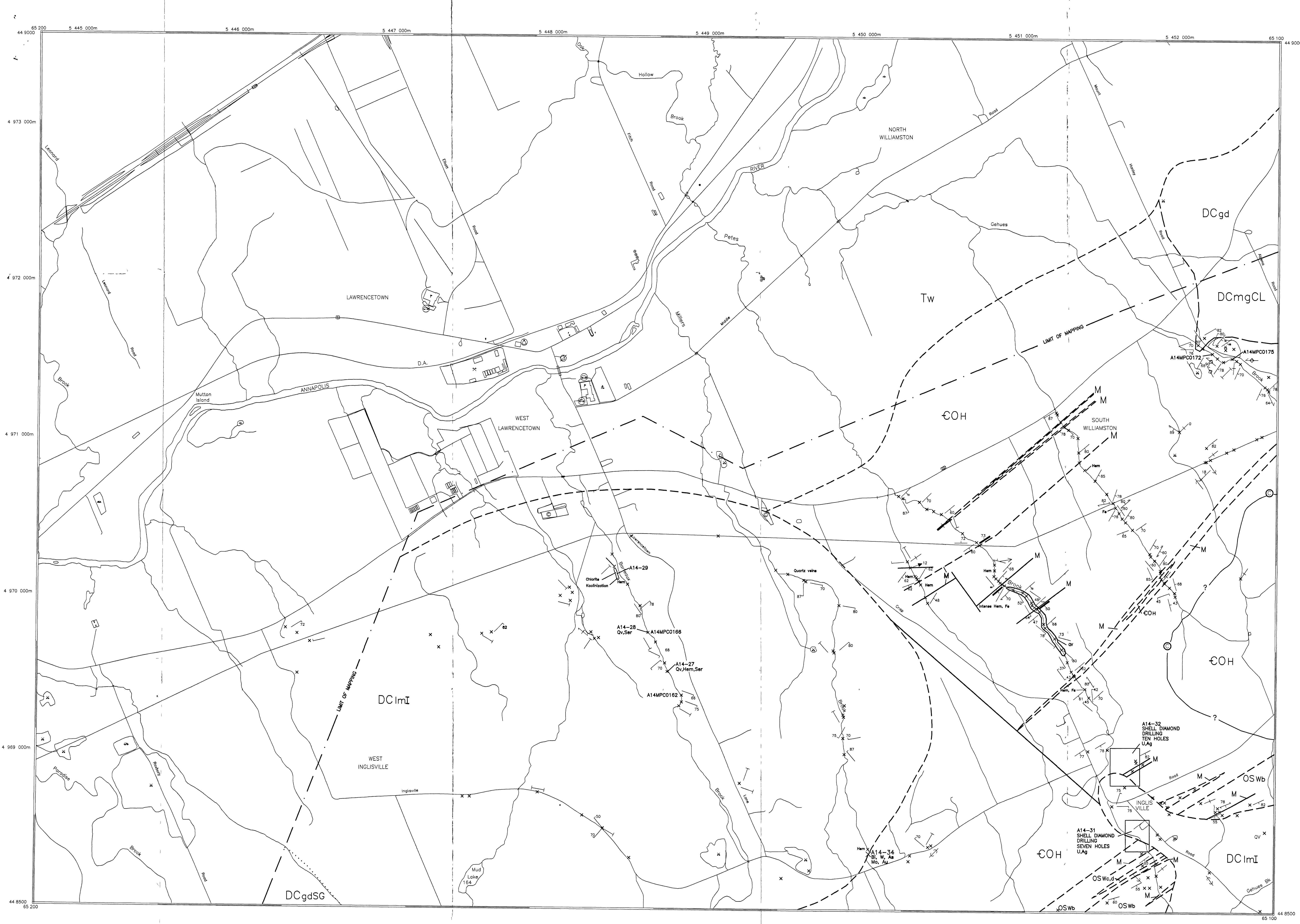
ROXBURY

ANNAPOLIS COUNTY, NOVA SCOTIA

M.P. CULLEN, P. C. WEBSTER, A.B. HUDGINS,

SCALE 1 : 10 000

100 0 500 1000 metres



GEOLOGICAL LEGEND

INTRUSIVE ROCKS

DEVONIAN

Middle to Upper Devonian

DC $\odot$ SOUTH MOUNTAIN BATHOLITH: includes granodiorite, monzonite, granite, monzonogranite, leucite, leucomonzonite; buff, white to pink or orange, equigranular to megacrystic, 3-13% muscovite, 2-7% biotite

DCmg $\odot$ Cow Lake Monzonite: light to medium grey, slightly megacrystic, 12-15% biotite, trace muscovite

DCgsa $\odot$ Scrag Lake Granodiorite: light to medium grey, fine to coarse grain locally megacrystic, 10-18% biotite, trace muscovite

DCg $\odot$ Granodiorite and undivided granitoid phases

M Gabbro and diorite sills and dikes; age range of pre Upper Silurian to post Upper Devonian

STRATIFIED ROCKS

TRIASSIC

Tw WOLFVILLE FORMATION: predominantly reddish brown to pale grey arkosic sandstone and minor pebbly coarse sand shale

Lower Devonian

Dr TORBROOK FORMATION: a) predominantly thinly bedded grey siltstone and sandy siltstone with interbedded grey to brown quartz arenite near base, locally coquinitic b) medium to dark grey, thinly bedded siliceous and/or calcareous or phosphatic siltstone and grey to black silty limestone, locally fossiliferous c) bedded quartzitic iron deposits with magnetite and/or hematite, locally oolitic and/or coquinitic d) dark grey to black siliceous siltstone and associated heterolithic volcanogenic conglomerate or breccia e) thinly interbedded red quartz wacke, sandy siltstone and shale with frequent grey interbeds; fossiliferous to coquinitic locally

SILURIAN

Upper Silurian

Sk KENTVILLE FORMATION: a) fine grained, thinly laminated to thinly bedded, medium to dark grey or black siltstone and slate with minor interbedded quartz wacke; b) dark grey to black graphitic shale and infrequent volcanogenic siltstone or tuff interbeds near Torbrook Formation contact

Upper Silurian or Earlier

OSw WHITE ROCK FORMATION:

Upper Member: a) fine grained massive to blocky bedded quartz arenite plus interbedded dark grey and red, thinly bedded to laminated siliceous siltstone and sandy shale; locally with very thin volcanogenic wacke or tuff interbeds equivalent to "Double Quartzite" unit of Smithers (1973)

Lower Member: b) light grey green, medium to thick bedded quartz arenites with interbedded grey shale, finely laminated siltstone and lesser hemolitic equivalents c) mafic volcanics: dark grey green to black pillow lavas thin massive flows, local pillow breccia, tuff, lapilli tuff, chert, and/or siliceous, calcareous mudstone and hyaloclastites; d) felsic volcanics: light tan to grey, thinly bedded to massive ash, crystal tuff, welded tuff and infrequent thin flows; e) dark grey to black siliceous siltstone and associated heterolithic volcanogenic conglomerate or breccia; locally contains felsic tuff, rhyolite, mafic volcanic, diorite ? and siliceous siltstone fragments f) massively bedded quartz arenite (similar to Upper Member)

ORDOVICIAN

MEGUMA GROUP

COH HALIFAX FORMATION: a) medium to dark grey, thinly bedded to laminated siltstone and slate with sandy siltstone and very fine arenaceous laminae b) spotted slate to hornfels c) hornfels with local paragneissic banding at granite contacts d) pyritic siltstone and slate

COI GOLDMERE FORMATION: quartzite; minor slate (not mapped in Study Area)

COB

SYMBOLS

Geological Boundaries

defined

approximate

interpreted from aeromagnetics

anticline (defined, assumed)

syncline (defined, assumed)

approximate hornfels zone limit

approximate hematite zone limit

limit of mapping

trench, shaft

mine, quarry

report reference number

mineral occurrence, reference number

outcrop, sample number

outcrop, area

boulders, float

fault defined, approximate

fossil location

bedding: facing

inclined, vertical

layering: in lava, tuffa, inclined, vertical

pillowed flow: facing unknown, inclined, vertical

pillowed flow: facing known, inclined, vertical

S1 cleavage or foliation

inclined, vertical

S1 cleavage or foliation

inclined, vertical

shear: dextral, sinistral

inclined, vertical

intersection lineation: S0/S1

plunge indicated S0/S2

dike: inclined, vertical

joint: inclined, vertical

quartz vein: inclined, vertical

F1 fold axis: s, z, m

F2 fold axis: s, z, m

plunge indicated

social strike: direction known, unknown

Abbreviations

Py	pyrite	Sul	sulphide
Pb	pyrrhotite	Qv	quartz vein
Hem	hematite	Cu	copper
Cpy	chalcopyrite	U	uranium
Gr	galena	Ba	barium
Fed	feldspar	Zn	zinc
Mog	magnetite	As	arsenic
Tour	tourmaline	Au	gold
Bi	biotite	Mo	molybdenite
Musc	muscovite	W	wolframite
Epi	epidote	Si	silica
Chl	chlorite	Co	cobalt
Aspy	arsenopyrite	Fe	iron
Qtz	quartz	Mn	manganese
Bx	brecciation	Si	silicification
Ser	sericite	Pb	lead
		Ag	silver

$\odot$ South Mountain Batholith nomenclature from Ham and MacDonald, 1992.

* NOTE See Report Page 4, Figure 2 For Inferred Stratigraphic Order of Lithologic Subunits

REFERENCES

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Map

Grid North at Centre of Sheet $0^{\circ} 23' 3''$

Magnetic Declination in 1987 $20^{\circ} 39'$

Primary Reference Grid Nova Scotia 3' M.T.M.

Projected Base on Average Terrestrial System 1977 Datum

NOVA SCOTIA DEPARTMENT OF NATURAL RESOURCES

Sheet 44 8500 65 100

SILURIAN METALLOGENIC PROJECT

LAWRENCETOWN

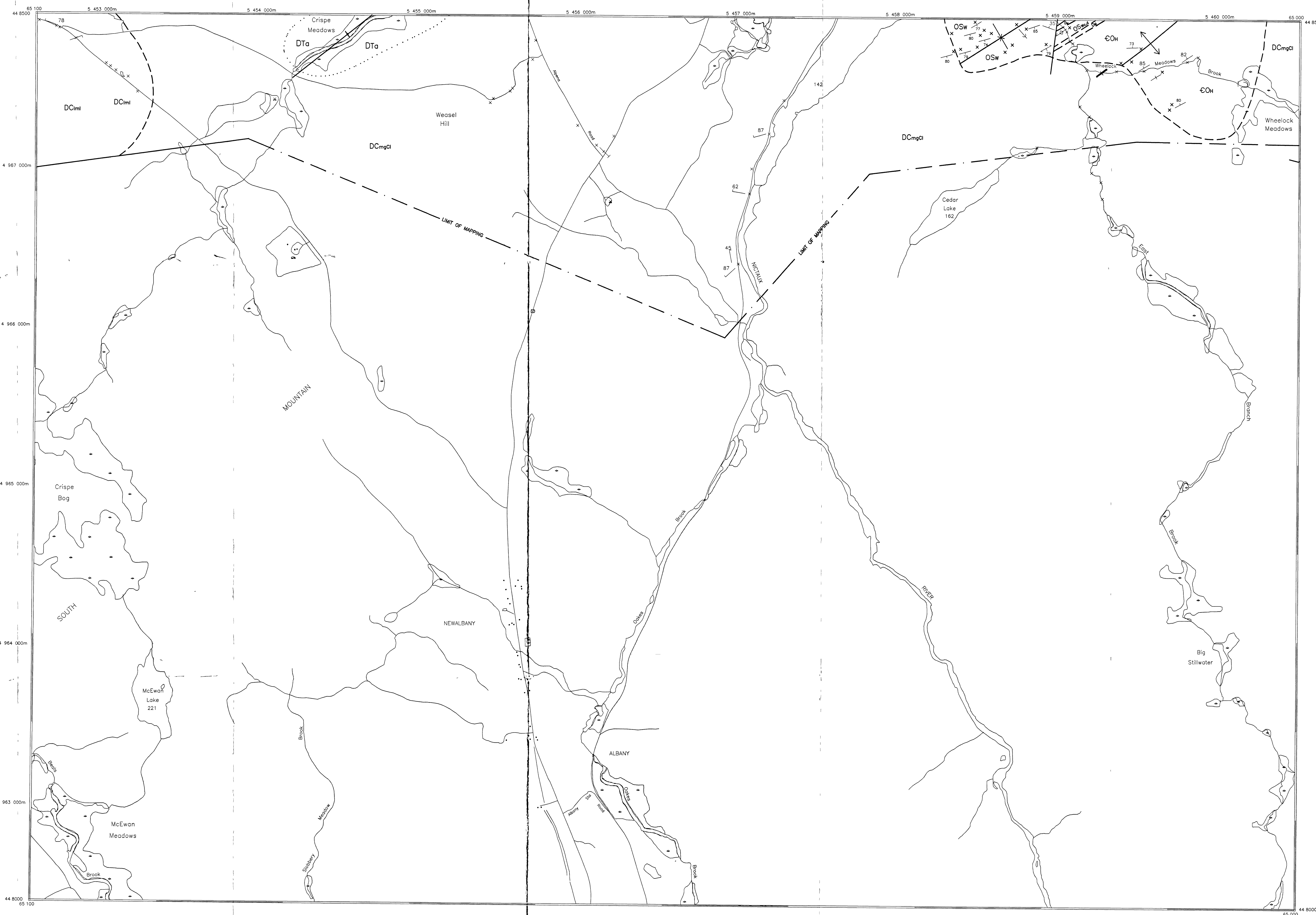
ANNAPOLIS COUNTY, NOVA SCOTIA

M.P. CULLEN, P. C. WEBSTER, A.B. HUDGINS,

SCALE 1 : 10 000

100 0 500 1000 metres

2



GEOLOGICAL LEGEND

INTRUSIVE ROCKS

DEVONIAN

Middle to Upper Devonian

DC OSw SOUTH MOUNTAIN BATHOLITH: includes granodiorite, monzonite, granite, leucogranite, and/or calcareous and/or phosphatic siltstone and grey to black silty limestone; locally fossiliferous; c) bedded quartzitic iron deposits with magnetite and/or hematite; locally oolitic and/or coquinitic d) dark grey to black siliceous siltstone and associated heterolithic volcanogenic conglomerate or breccia e) thin interbedded red quartz wacke, sandy siltstone and shale with frequent grey interbeds; fossiliferous to coquinitic locally

DCm Cloud Lake Monzonite: light to medium grey, slightly megacrystic, 12-18% biotite, trace muscovite

DCgss Soraq Lake Granodiorite: light to medium grey, fine to coarse grain locally megacrystic, 10-18% biotite, trace muscovite

DCg Granodiorite and undivided granitoid phases

M Gabro and diabase sills and dikes; age range of pre Upper Silurian to post Upper Devonian

STRATIFIED ROCKS

TRIASSIC

Tw WOLFVILLE FORMATION: predominantly reddish brown to pale grey arkosic sandstone and minor pebbly arkose and shale

Lower Devonian

Dt TORBROOK FORMATION: a) predominantly thinly bedded grey siltstone and sandy siltstone with interbedded grey to brown quartz arenite near base; locally coquinitic b) medium to dark grey, thin bedded siliceous and/or calcareous or phosphatic siltstone and grey to black silty limestone; locally fossiliferous; c) bedded quartzitic iron deposits with magnetite and/or hematite; locally oolitic and/or coquinitic d) dark grey to black siliceous siltstone and associated heterolithic volcanogenic conglomerate or breccia e) thin interbedded red quartz wacke, sandy siltstone and shale with frequent grey interbeds; fossiliferous to coquinitic locally

SILURIAN

Upper Silurian

Sk KENTVILLE FORMATION: a) fine grained, thinly laminated to thinly bedded, medium to dark grey or black siltstone and shale with minor interbedded quartz wacke b) dark grey to black graphitic shale and infrequent volcanogenic siltstone or tuff interbeds near Torbrook Formation contact

Upper Silurian or Earlier

OSw WHITE ROCK FORMATION:

Upper Member: a) fine grained massive to thickly bedded quartz arenite plus interbedded dark grey and red, thinly bedded to laminated siliceous siltstone and sandy shale; locally with very thin volcanogenic wacke or tuff interbeds; equivalent to "Double Quartzite" unit of Smithers (1973)

Lower Member: b) light grey green, medium to thick bedded quartz arenites with interbedded grey shale, finely laminated siltstone and lesser hematitic equivalents c) mafic volcanics: dark grey green to black pillow lavas thin massive flows, local pillow breccia, tuff, lapilli tuff, chert and/or siliceous, calcareous mudstone and hydroclastic; d) felsic volcanics: light tan to grey, thin bedded to massive ash, crystal tuff, welded tuff and infrequent thin flows; e) dark grey to black siliceous siltstone and associated heterolithic volcanogenic conglomerate or breccia; locally contains felsic tuff, rhyolite, mafic volcanic, diorite ? and siliceous siltstone fragments f) massively bedded quartz arenite (similar to Upper Member)

ORDOVICIAN

MEDUNA GROUP

EOH HALIFAX FORMATION: a) medium to dark grey, thin bedded to laminated siltstone and shale with sandy siltstone and very fine arenaceous laminae b) spotted slate to hornfels c) hornfels with local porphyroblastic banding at granite contacts d) pyritic siltstone and slate

EOs GOLDENVILLE FORMATION: quartzite; minor slate (Not mapped in Study Area)

SYMBOLS

Geological Boundaries

— defined

- - - approximate

⊖ interpreted from aeromagnetics

— anticline (defined, assumed)

— syncline (defined, assumed)

⊖ approximate hornfels zone limit

⊖ approximate hematite zone limit

⊖ limit of mapping

⊖ trench, shaft

⊖ mine, quarry

⊖ diamond drill hole, report reference number

⊖ mineral occurrence, reference number

⊖ outcrop

⊖ boulders, float

⊖ fault defined, approximate

⊖ fossil location

⊖ bedding; facing inclined, vertical

⊖ layering in lavas, tuffs, inclined, vertical

⊖ pillowed flows: facing unknown, inclined, vertical

⊖ pillowed flows: facing known, inclined, vertical

⊖ S1 cleavage or foliation inclined, vertical

⊖ S1 cleavage or foliation inclined, vertical

⊖ shear: dextral, sinistral inclined, vertical

⊖ intersection lineation; S0/S1 plunge indicated S0/S2

⊖ dike: inclined, vertical

⊖ joint: inclined, vertical

⊖ quartz vein: inclined, vertical

⊖ F1 fold axis: s, z, m

⊖ F2 fold axis: crenulation axis: s, z, m

⊖ plunge indicated

⊖ glacial striae: direction known, unknown

Abbreviations

Py	pyrite	Sul	sulphide
Po	pyrrhotite	QV	quartz vein
Hem	hematite	Cu	copper
Chc	chalcocite	U	uranium
Gr	garnet	Ba	barium
Feld	feldspar	Zn	zinc
Mg	magnetite	As	arsenic
Tour	tourmaline	Au	gold
Si	biotite	Mo	molybdenite
Musc	muscovite	W	wolframite
Ep	epidote	Bi	blende
Chl	chlorite	Co	cobalt
Apy	arenaceous pyrite	Fe	iron
Qtz	quartz	Mn	manganese
Al	aluminum	Si	silicification
Ser	sericite	Pb	lead
		Ag	silver

⊖ South Mountain Batholith nomenclature from Horn and MacDonald, 1982.

* NOTE See Report Page 4, Figure 2 For Inferred Stratigraphic Order of Lithologic Subunits

REFERENCES

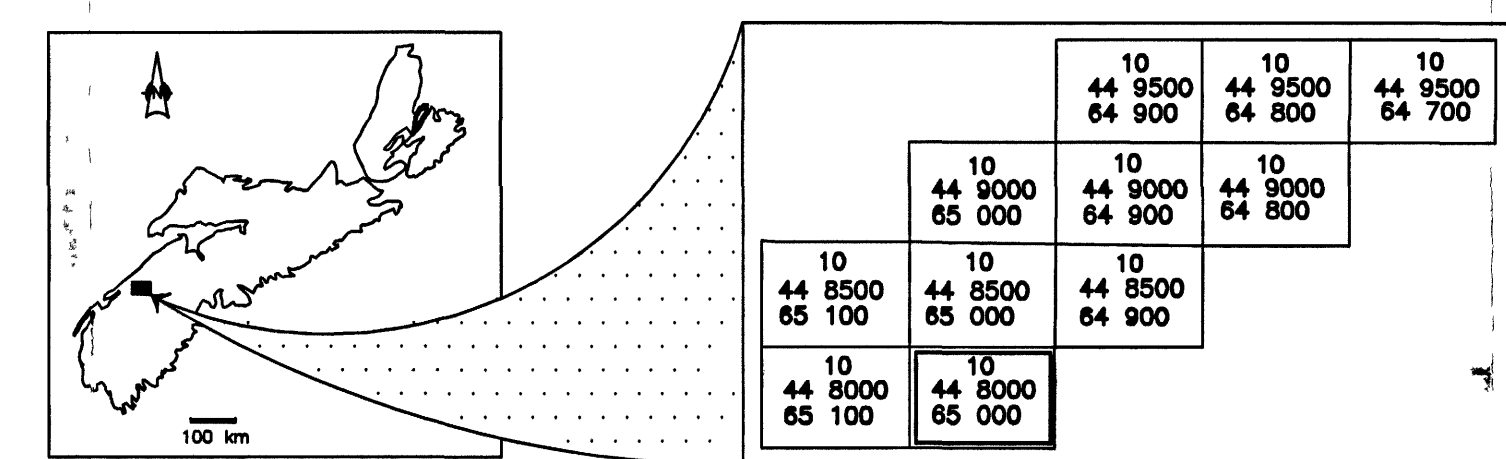
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Grid North at Centre of Sheet 7° 23' 3"

Magnetic Declination in 1987 20' 39"

Primary Reference Grid Nova Scotia 3° M.T.M.

Projected Base on Average Terrestrial System 1977 Datum

NOVA SCOTIA DEPARTMENT OF NATURAL RESOURCES

Sheet 44 8000 65 000

SILURIAN METALLOGENIC PROJECT

ALBANY

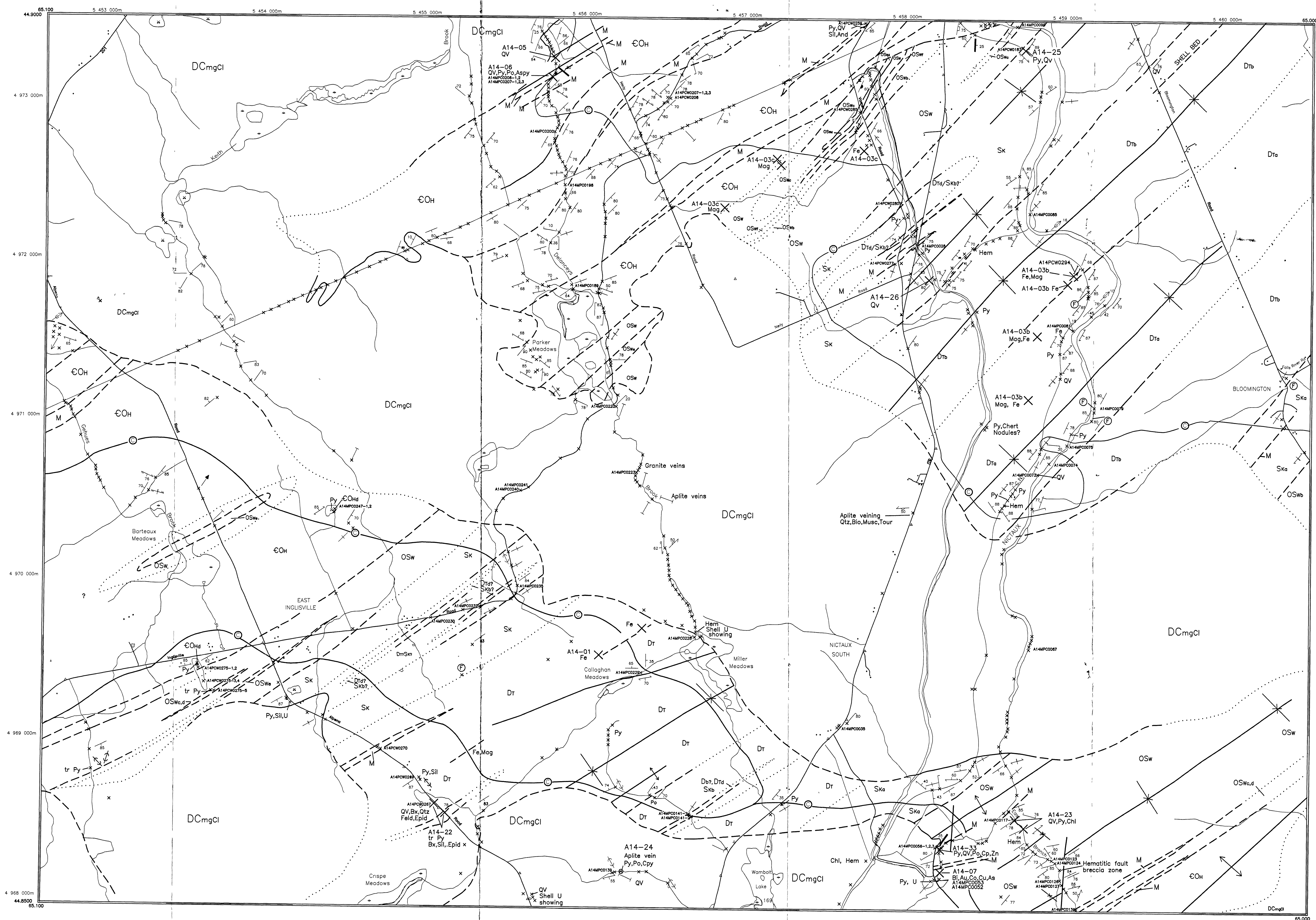
ANNAPOLIS COUNTY, NOVA SCOTIA

M.P. CULLEN, P. C. WEBSTER, A.B. HUDGINS,

SCALE 1 : 10 000

100 0 500 1000 metres

3



GEOLOGICAL LEGEND

INTRUSIVE ROCKS

DEVONIAN

DC SOUTH MOUNTAIN BATHOLITH: includes granodiorite, monzogranite, granite, leucomonzogranite

DCmg Inglewood Leucomonzogranite: buff, white to pink or orange; equigranular to megacrystic, 3-13% muscovite, 2-7% biotite

DCmgd Cloud Lake Monzogranite: light to medium grey, slightly megacrystic, 12-15% biotite, trace muscovite

DCmgg Strong Lake Granodiorite: light to medium grey, fine to coarse grain locally megacrystic, 10-18% biotite, trace muscovite

DCg Granodiorite and undivided granitoid phases

M Gabro and diorite sills and dikes; age range of pre Upper Silurian to post Upper Devonian

STRATIFIED ROCKS

TRIASSIC

Tw WOLFVILLE FORMATION: predominantly reddish brown to pale grey arkose sandstone and minor pebbly arkose and shale

Lower Devonian

Dr TORBROOK FORMATION: a) predominantly thinly bedded grey siltstone and sandy siltstone with interbedded grey to brown quartz arenite near base; locally coquina b) medium to dark grey, thinly bedded siliceous and/or calcareous or phosphatic siltstone and grey to black silty limestone; locally fossiliferous; c) bedded quartzitic iron deposits with magnetite and/or hematite; locally oolitic and/or coquina d) dark grey to black siliceous siltstone and associated heterolithic volcanogenic? conglomerate or breccia e) thinly interbedded red quartz wacke, sandy siltstone and shale with frequent grey interbeds; fossiliferous to coquina locally

SILURIAN

Upper Silurian

Sk KENTVILLE FORMATION: a) fine grained, thinly laminated to thinly bedded, medium to dark grey or black siltstone and slate with minor interbedded quartz wacke; b) dark grey to black graphitic shale and infrequent volcanogenic siltstone or tuff interbeds near Torbrook Formation contact

Upper Silurian or Earlier

OSw WHITE ROCK FORMATION: Upper Member: a) fine grained massive to thickly bedded quartz arenite plus interbedded dark grey and red, thinly bedded to laminated siliceous siltstone and sandy shale; locally with very thin volcanogenic wacke or tuff interbeds; equivalent to "Double Quartzite" unit of Smithersdale (1973) Lower Member: b) light grey green, medium to thick bedded quartz arenites with interbedded grey shale, finely laminated siltstone and lesser hematitic equivalents c) mafic volcanics: dark grey green to black pillow lavas thin massive flows, local pillow breccia, tuff, lapilli tuff, chert and/or siliceous, calcareous mudstone and hydroids; d) felsic volcanics: light tan to grey, thinly bedded to massive ash, crystal tuff, welded tuff and infrequent thin flows; e) dark grey to black siliceous siltstone and associated heterolithic volcanogenic conglomerate or breccia; locally contains felsic tuff, rhyolite, mafic volcanic, diorite ? and siliceous siltstone fragments f) massively bedded quartz arenite (similar to Upper Member)

ORDOVICIAN

MEDUSA GROUP

COh HALIFAX FORMATION: a) medium to dark grey, thinly bedded to laminated siltstone and slate with sandy siltstone and very fine arenaceous laminae b) spotted slate to hornfels c) hornfels with local paragneissic banding at granite contacts d) pyritic siltstone and slate

COg GOLDENVILLE FORMATION: quartzite; minor slate (Not mapped in Study Area)

SYMBOLS

Geological Boundaries

— defined

- - - approximate

⊕ assumed

⊖ interpreted from aeromagnetics

⊕ anticline (defined, assumed)

⊖ syncline (defined, assumed)

⊕ approximate hematite zone limit

⊖ approximate hematite zone limit

⊕ limit of mapping

⊖ limit of mapping

⊕ trench, shaft

⊖ mine, quarry

⊕ diamond drill hole

⊖ report reference number

⊕ mineral occurrence

⊖ reference number

⊕ outcrop, sample number

⊖ outcrop, area

⊕ boulders, float

⊖ fault defined, approximate

⊕ fossil location

⊖ bedding: facing

⊕ inclined, vertical

⊖ layering: in lavas, tuffs

⊕ inclined, vertical

⊖ pillowed flows: facing unknown, inclined, vertical

⊕ pillowed flows: facing known, inclined, vertical

⊖ S1 cleavage or foliation

⊕ inclined, vertical

⊖ S1 cleavage or foliation

⊕ inclined, vertical

⊖ shear, dextral, sinistral

⊕ inclined, vertical

⊖ intersection lineation, S0/S1

⊕ plunge indicated S0/S2

⊖ dikes: inclined, vertical

⊕ joint: inclined, vertical

⊖ quartz vein: inclined, vertical

⊕ F1 fold axis: s, z, m

⊖ F2 fold axis: s, z, m

⊕ plunge indicated

⊖ glacial striae: direction known, unknown

Abbreviations

Py pyrite

Po pyrrhotite

Hem hematite

Cpy chalcopyrite

Sp sphalerite

Fe feldspar

Mag magnetite

Tour tourmaline

Bio biotite

Musc muscovite

Epil epidote

Ch chert

Aspy arsenopyrite

Qtz quartz

Bx brecciation

Ser sericite

Sul sulphide

QV quartz vein

Cu copper

U uranium

Ba barium

Zn zinc

Ag argentic

Mo molybdenite

Wf wolframite

Bl blende

Co cobalt

Fe iron

Mn manganese

Sil silicification

Lead lead

Ag silver

⊕ South Mountain Batholith nomenclature from Ham and MacDonald, 1992.

⊕ NOTE See Report Page 4, Figure 2 For Inferred Stratigraphic Order of Lithologic Subunits

REFERENCES

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WRIGHT, J.D. 1975. Iron Deposits of Nova Scotia. Nova Scotia Dept. of Natural Resources. Economic Geology Series 75-1.

Map Scale

100 0 500 1000 metres

Grid North at Centre of Sheet 0° 23' 3"

Magnetic Declination in 1987 20° 39' 3"

Primary Reference Grid Nova Scotia 3° M.T.M.

Projected Base on Average Terrestrial System 1977 Datum

NOVA SCOTIA DEPARTMENT OF NATURAL RESOURCES

Sheet 44 8500 65 000

SILURIAN METALLOGENIC PROJECT

NICTAUX SOUTH

ANNAPOLIS COUNTY, NOVA SCOTIA

M.P. CULLEN, P. C. WEBSTER, A.B. HUDGINS,

SCALE 1 : 10 000

100 0 500 1000 metres



GEOLOGICAL LEGEND

INTRUSIVE ROCKS

DEVONIAN

Middle to Upper Devonian

DC South Mountain Batholith: Includes granodiorite, monzonite, granite, leucogranite

DCme Inglisville Leucogranite: buff, white to pink or orange, equigranular to megacrystic, 3-13% muscovite, 2-7% biotite

DCmgi Cloud Lake Monzonite: light to medium grey, slightly megacrystic, 12-15% biotite, trace muscovite

DCgss Song Lake Granodiorite: light to medium grey, fine to coarse grain locally megacrystic, 10-15% biotite, trace muscovite

DCge Grandiorite and undivided granitoid phases

M Gabbro and diabase sills and dikes; age range of pre Upper Silurian to post Upper Devonian

STRATIFIED ROCKS

TRIASSIC

Tw WOLFVILLE FORMATION: predominantly reddish brown to pale grey arkosic sandstone and minor pebbly arkose and shale

Lower Devonian

Dr TORBROOK FORMATION: a) predominantly thinly bedded grey siltstone and sandy siltstone with interbedded grey to brown quartz arenite near base; locally coquina; b) medium to dark grey, thinly bedded siliceous and/or calcareous or phosphatic siltstone and grey to black silty limestone; locally fossiliferous; c) bedded quartzite iron deposits with magnetite and/or hematite; locally oolitic and/or coquina; d) dark grey to black siliceous siltstone and associated heterolithic volcanogenic? conglomerate or breccia; e) thinly interbedded red quartz wacke, sandy siltstone and shale with frequent grey interbeds; fossiliferous to coquina locally

SILURIAN

Upper Silurian

Sk KENYON FORMATION: a) fine grained, thinly laminated to thinly bedded, medium to dark grey or black siltstone and slate with minor interbedded quartz wackes; b) dark grey to black graphitic shale and interbedded red quartz siltstone or tuff interbeds near Torbrook Formation contact

Upper Silurian or Earlier

OSw WHITE ROCK FORMATION:

Upper Member: a) fine grained massive to thickly bedded quartz arenite plus interbedded dark grey and red, thinly bedded to laminated siliceous siltstone and sandy shale; locally with very thin volcanogenic wacke or tuff interbeds; equivalent to "Double Quartzite" unit of Smitheringale, (1973)

Lower Member: b) light grey green, medium to thick bedded quartz arenites with interbedded grey shale, finely laminated siltstone and lesser hematitic equivalents

c) mafic volcanics: dark grey green to black pillow lavas thin massive flows, local pillow breccia, tuff, lapilli tuff, chert and/or siliceous, calcareous mudstone and hydroclastic; d) felsic volcanics: light tan to grey, thinly bedded to massive ash, crystal tuff, welded tuff and infrequent thin flows; e) dark grey to black siliceous siltstone and associated heterolithic volcanogenic conglomerate or breccia; locally contains felsic tuff, rhyolite, mafic volcanic, diorite? and siliceous siltstone fragments

f) heavily bedded quartz arenite (similar to Upper Member)

ORDOVICIAN

MEGUMA GROUP

COH HALIFAX FORMATION: a) medium to dark grey, thinly bedded to laminated siltstone and slate with sandy siltstone and very fine arenaceous laminae b) spotted slate to hornfels c) hornfels with local paragneissic banding at granite contacts d) pyritic siltstone and slate

COG GOLDENVILLE FORMATION: quartzite; minor slate (Not mapped in Study Area)

SYMBOLS

Geological Boundaries

— defined

- - - approximate

..... assumed

○ interpreted from aeromagnetics

— anticline (defined, assumed)

— syncline (defined, assumed)

○ approximate hornfels zone limit

○ approximate hematite zone limit

○ limit of mapping

— trench, shaft

★ mine, quarry

● diamond drill hole, report reference number

✕ mineral occurrence, reference number

✕ outcrop, sample number

○ outcrop, ore

○ boulders, float

— fault defined, approximate

○ fossil location

|| bedding: facing inclined, vertical

|| layering: in lava, tuff, inclined, vertical

|| pillow flows: facing known, inclined, vertical

|| S1 cleavage or foliation inclined, vertical

|| S1 cleavage or foliation inclined, vertical

|| shear: dextral, sinistral inclined, vertical

|| intersection lineation, S0/S1 plunge indicated S0/S2

|| dike: inclined, vertical

|| joint: inclined, vertical

|| quartz vein: inclined, vertical

|| F1 fold axis: s, z, m

|| F2 fold axis: crenulation axis: s, z, m

|| plunge indicated

|| glacial striae: direction known, unknown

Abbreviations

Py	pyrite	Sul	sulphide
Po	pyrrhotite	Qz	quartz vein
Hem	hematite	Cu	copper
Chl	chlorite	U	uranium
Gn	garnet	Ba	barium
Feld	feldspar	Zn	zinc
Mg	magnetite	As	arsenic
Tour	tourmaline	Au	gold
Bio	biotite	Mo	molybdenite
Musc	muscovite	W	wolframite
Epid	epidote	Bi	blende
Chl	chlorite	Co	cobalt
Aspy	arsenopyrite	Fe	iron
Qtz	quartz	Mn	manganese
Bx	brecciation	Sil	silicification
Ser	sericite	Pb	lead
		Ag	silver

○ South Mountain Batholith nomenclature from Ham and MacDonald, 1992.

• NOTE: See Report Page 4, Figure 2 For Inferred Stratigraphic Order of Lithologic Subunits

REFERENCES

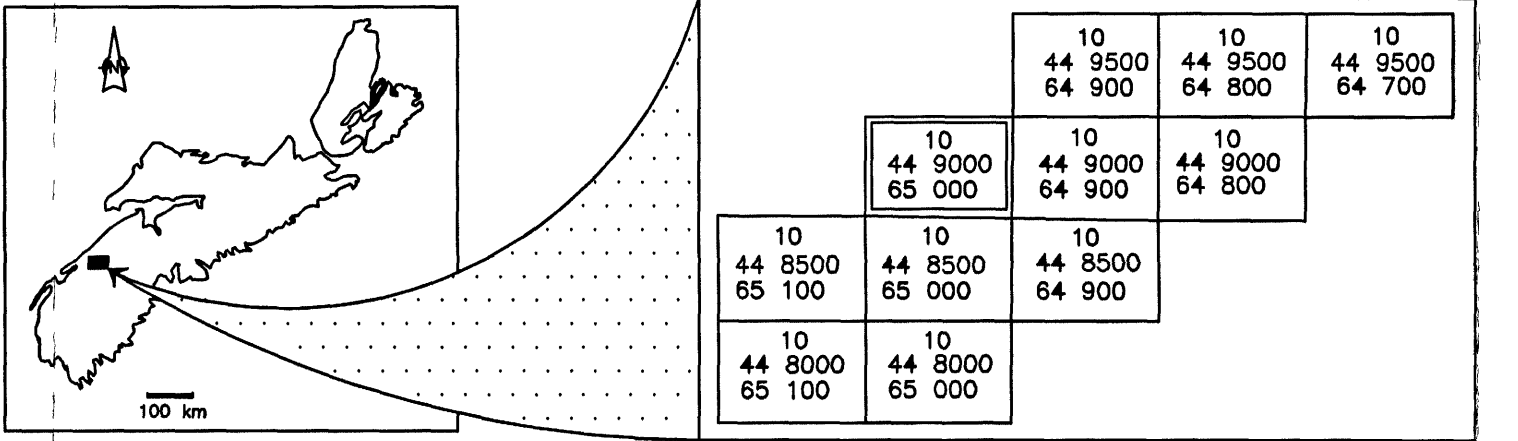
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Grid North at Centre of Sheet 07 23'3"

Magnetic Declination in 1987 20' 39"

Primary Reference Grid Nova Scotia 3' M.T.M.

Projected Base on Average Terrestrial System, 1977 Datum

NOVA SCOTIA DEPARTMENT OF NATURAL RESOURCES

Sheet 44 9000 65 000

SILURIAN METALLOGENIC PROJECT

MIDDLETON

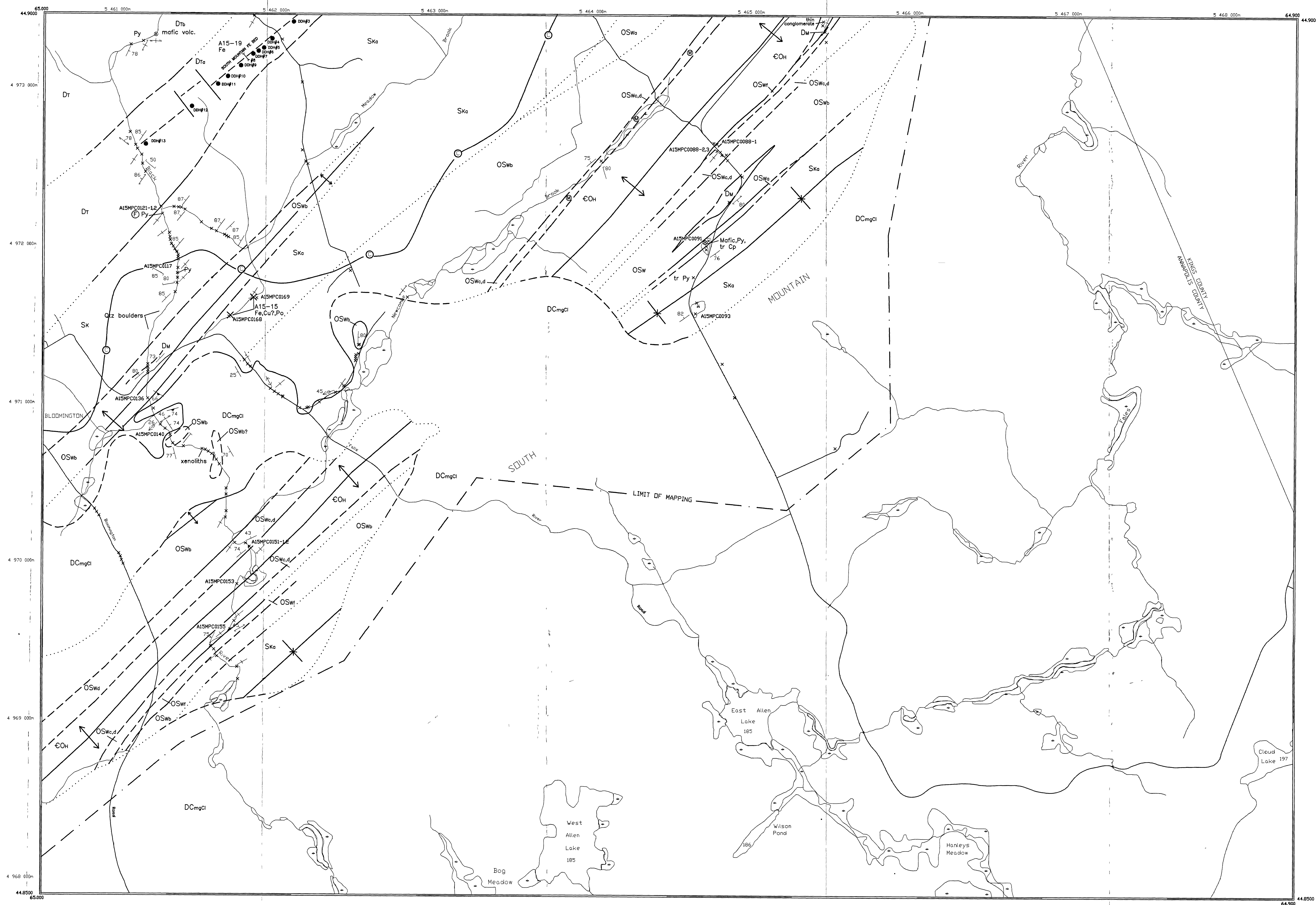
ANNAPOLIS COUNTY, NOVA SCOTIA

M.P. CULLEN, P. C. WEBSTER, A.B. HUDGINS,

SCALE 1 : 10 000

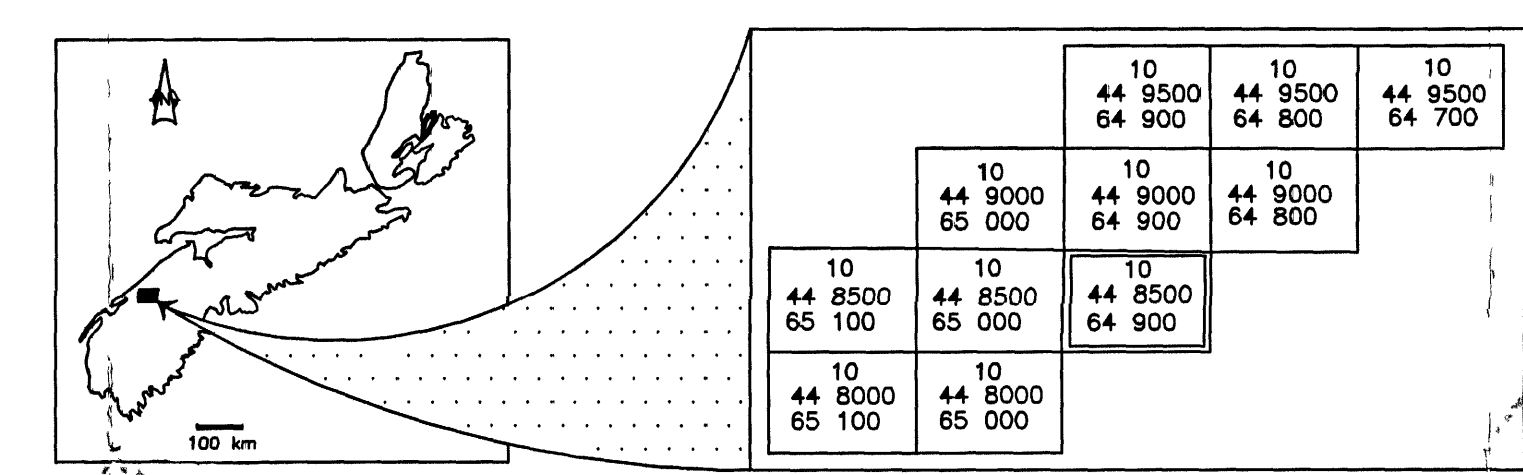
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5



- GEOLOGICAL LEGEND**
- INTRUSIVE ROCKS**
- DEVONIAN**
- Middle to Upper Devonian
- DC SOUTH MOUNTAIN BATHOLITH: includes granodiorite, monzogranite, granite, leucomonzogranite, pegmatite, quartzite, buff, white to pink or orange, equigranular to megacrystic, 3-13% muscovite, 2-7% biotite
- DCmg Cloud Lake Monzogranite: light to medium grey, slightly megacrystic, 12-15% biotite, trace muscovite
- DCgss Sprag Lake Granodiorite: light to medium grey, fine to coarse grain locally megacrystic, 10-18% biotite, trace muscovite
- DCgr Granodiorite and undivided granitoid phases
- M Gabbro and diorite sills and dikes; age range of pre Upper Silurian to post Upper Devonian
- STRATIFIED ROCKS**
- TRIASSIC**
- Tw WOLFVILLE FORMATION: predominantly reddish brown to pale grey arkosic sandstone and minor pebbly arkose and shale
- SILURIAN**
- Upper Silurian
- Sk KENTVILLE FORMATION: a) fine grained, thinly laminated to finely bedded, medium to dark grey or black siltstone and slate with minor interbedded quartz wacke; b) dark grey to black granitic shale and infrequent volcanogenic siltstone or tuff interbeds near Torbrook Formation contact
- Upper Silurian or Earlier
- OSw WHITE ROCK FORMATION: Upper Member: a) fine grained massive to thickly bedded quartz arenite plus interbedded dark grey and red, finely bedded to laminated siliceous siltstone and sandy shale; locally with very thin volcanogenic waste or tuff interbeds; equivalent to "Double Quartzite" unit of Smitheringale (1973) Lower Member: b) light grey green, medium to thick bedded quartz arenites with interbedded grey shale, finely laminated siltstone and lesser hemilitic equivalents c) mafic volcanics: dark grey green to black pillow lavas thin massive flows, local pillow breccia, tuff, lapilli tuff, chert and/or siliceous, calcareous mudstone and hyaloclastite; d) felsic volcanics: light tan to grey, finely bedded to massive ash, crystal tuff, welded tuff and infrequent thin flows; e) dark grey to black siliceous siltstone and associated heterolithic volcanogenic conglomerate or breccia; locally contains felsic tuff, rhyolite, mafic volcanic, diorite ? and siliceous siltstone fragments f) massively bedded quartz arenite (similar to Upper Member)
- ORDOVICIAN**
- MEGUMA GROUP
- COx HALFAX FORMATION: a) medium to dark grey, finely bedded to laminated siltstone and slate with sandy siltstone and very fine arenaceous laminae b) spotted siltstone to hornfels c) hornfels with local paragneissic banding at granite contacts d) pyritic siltstone and slate
- COg GOLDENVILLE FORMATION: quartzite; minor siltstone (Not mapped in Study Area)
- SYMBOLS**
- Geological Boundaries
- defined
- approximate
- assumed
- interpreted from aeromagnetics
- anticline (defined, assumed)
- syncline (defined, assumed)
- approximate hornfels zone limit
- approximate hematite zone limit
- limit of mapping
- trench, shaft
- mine, quarry
- diamond drill hole, report reference number
- mineral occurrence, reference number
- outcrop, sample number
- outcrop, area
- boulders, float
- fault defined, approximate
- fossil location
- bedding: facing
- inclined, vertical
- layering: in lavas, tuffs, inclined, vertical
- pillowed flows: facing unknown, inclined, vertical
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- S1 cleavage or foliation inclined, vertical
- S1 cleavage or foliation inclined, vertical
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- intersection lineation: S0/S1 plunge indicated S0/S2
- dike: inclined, vertical
- joint: inclined, vertical
- quartz vein: inclined, vertical
- F1 fold axis: s, z, m
- F2 fold axis: crenulation axis: s, z, m
- plunge indicated
- glacial striae: direction known, unknown
- Abbreviations**
- | | | | |
|------|----------------|-----|-------------|
| Py | pyrite | Sul | sulphide |
| Po | pyrrhotite | Sv | quartz vein |
| Ham | hematite | Cu | copper |
| Cpy | chalcocopyrite | U | uranium |
| Gal | galena | Ba | barium |
| Feld | feldspar | Zn | zinc |
| Mag | magnetite | As | arsenic |
| Tour | tourmaline | Au | gold |
| Bio | biotite | Mo | molybdenite |
| Musc | muscovite | W | volfrumite |
| Ep | epidote | Bl | blennium |
| Ch | chlorite | Cu | coadit |
| Aspy | arsenopyrite | Fe | iron |
| Qtz | quartz | Mn | manganese |
| Sk | silicification | Pb | lead |
| Ser | sericite | Ag | silver |
- South Mountain Batholith nomenclature from Ham and Macdonald, 1992.
- NOTE: See Report Page 4, Figure 2 For Inferred Stratigraphic Order of Lithologic Subunits

- REFERENCES**
- HAM, L.J., MACDONALD, M.A. 1992. Geological Map of Gaspeau Lake, Nova Scotia. Dept. of Natural Resources, Map 92-1.
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- WILGOT, J.D. 1975. Van Dyke of Nova Scotia Nova Scotia Dept. of Natural Resources, Economic Geology Series 75-1.



Grid North at Centre of Sheet 7° 23' 3"

Magnetic Declination in 1987 20° 39'

Primary Reference Grid Nova Scotia 3° M.T.M.

Projected Base on Average Terrestrial System

1977 Datum

NOVA SCOTIA DEPARTMENT OF NATURAL RESOURCES

Sheet 44 8500 64 900

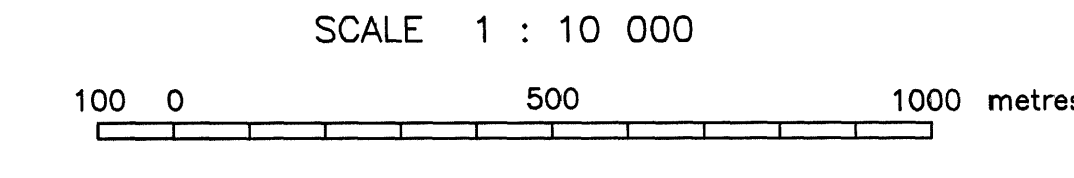
SILURIAN METALLOGENIC PROJECT

BLACK RIVER

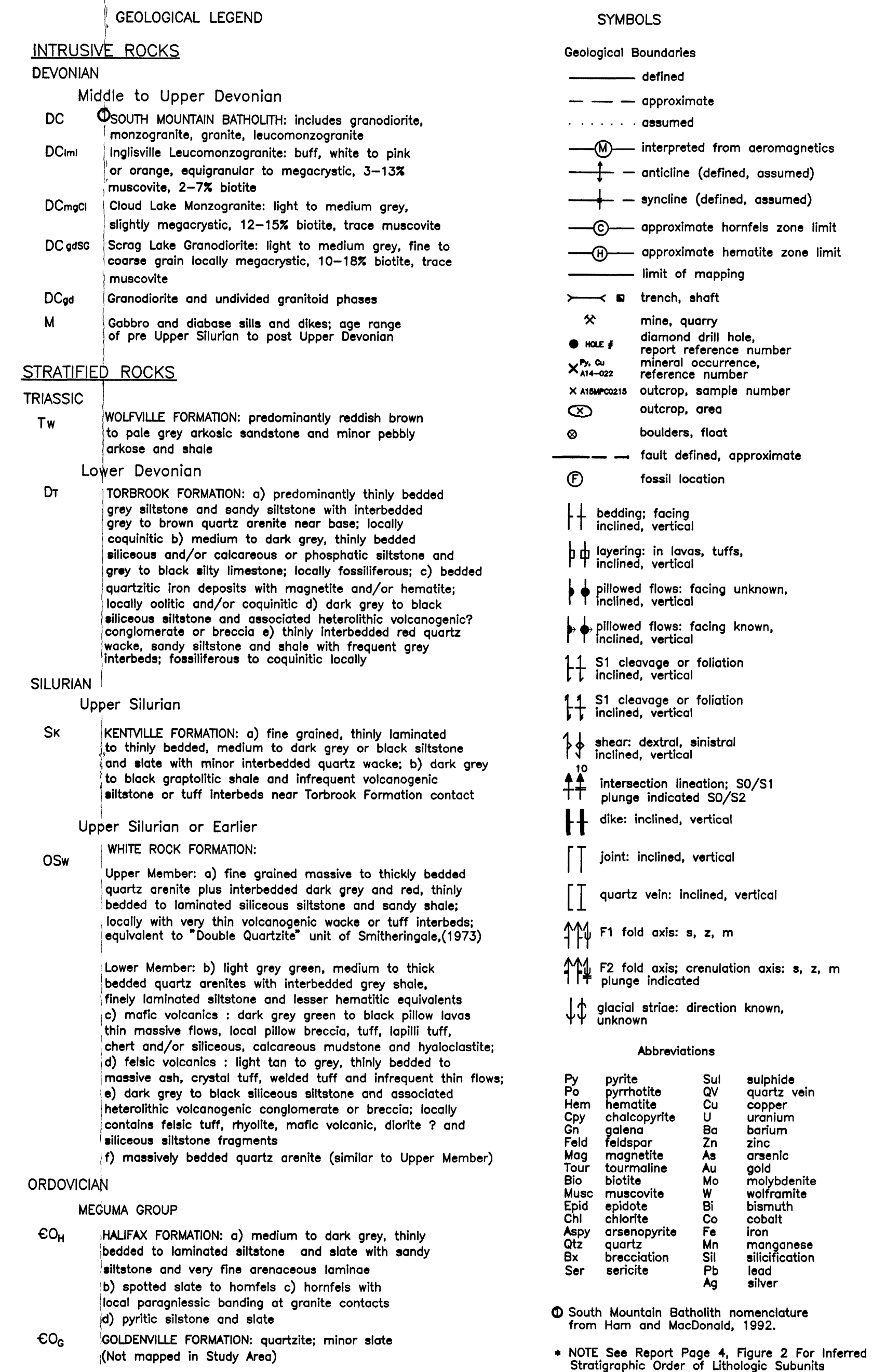
ANNAPOLIS COUNTY, NOVA SCOTIA

M.P. CULLEN, P. C. WEBSTER, A.B. HUGGINS,

SCALE 1 : 10 000



OFR 96-010



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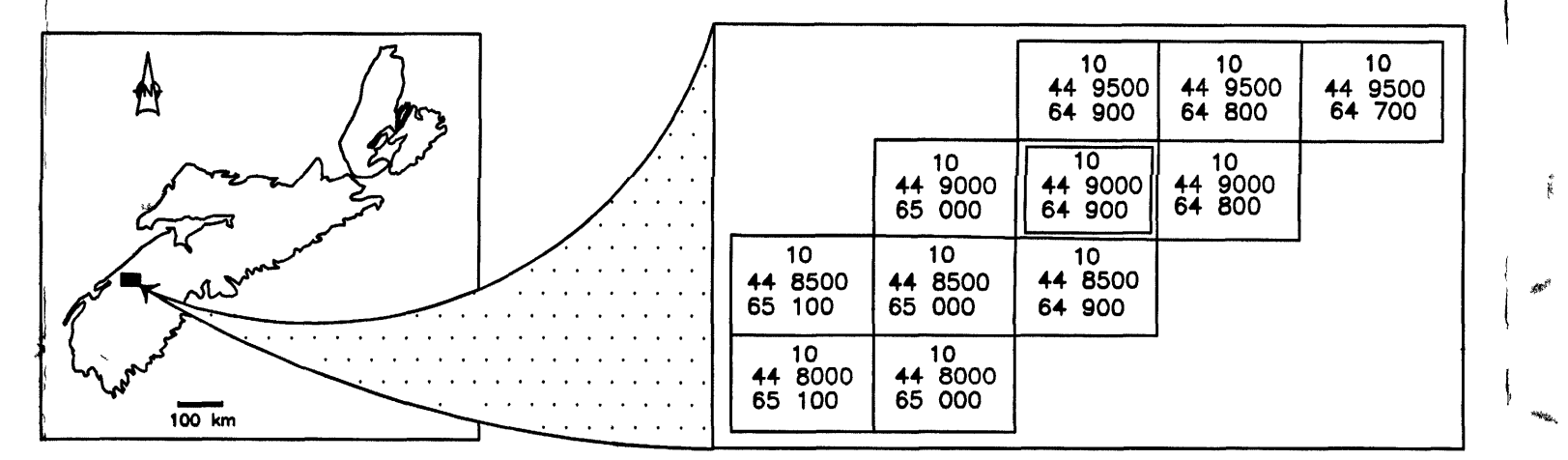
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Grid North at Centre of Sheet $0^{\circ} 23' 3''$
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 Primary Reference Grid Nova Scotia 3rd M.T.M.
 Projected Base on Average Terrestrial System
 1977 Datum



GEOLOGICAL LEGEND

INTRUSIVE ROCKS

DEVONIAN

DC Middle to Upper Devonian

DCmi Osgood Mountain Batholith: includes granodiorite, monzogranite, granite, leucomonzogranite

DCmg Cloud Lake Monzogranite: light to medium grey, slightly megacrystic, 12-15% biotite, trace muscovite

DCgss Sarg Lake Granodiorite: light to medium grey, fine to coarse grain locally megacrystic, 10-18% biotite, trace muscovite

DCgs Granodiorite and undivided granitoid phases

M Gabbro and diorite sills and dikes; age range of pre Upper Silurian to post Upper Devonian

STRATIFIED ROCKS

TRIASSIC

Tw WOLFVILLE FORMATION: predominantly reddish brown to pale grey arkosic sandstone and minor pebbly arkose and shale

Lower Devonian

Dn TORBROOK FORMATION: a) predominantly thinly bedded grey siltstone and sandy siltstone with interbedded grey to brown quartz arenite near base; locally coarsitic b) medium to dark grey, thinly bedded siliceous and/or calcareous or phosphatic siltstone and grey to black silty limestone, locally fossiliferous; c) bedded quartzitic iron deposits with magnetite and/or hematite; locally calcitic and/or coarsitic d) dark grey to black siliceous siltstone and associated heterolithic volcanogenic conglomerate or breccia e) thinly interbedded red quartz wacke, sandy siltstone and shale with frequent grey interbeds; fossiliferous to coarsitic locally

SILURIAN

Upper Silurian

Sk KENTVILLE FORMATION: a) fine grained, thinly laminated to thinly bedded, medium to dark grey or black siltstone and slate with minor interbedded quartz wacke; b) dark grey to black granitic siltstone and infrequent volcanogenic siltstone or tuff interbeds near Torbrook Formation contact

Upper Silurian or Earlier

OSw WHITE ROCK FORMATION:

Upper Member: a) fine grained massive to thickly bedded quartz arenite plus interbedded dark grey and red, thinly bedded to laminated siliceous siltstone and sandy shale; locally with very thin volcanogenic wacke or tuff interbeds; equivalent to "Double Quartzite" unit of Smitheringale (1973)

Lower Member: b) light grey green, medium to thick bedded quartz arenites with interbedded grey shale, finely laminated siltstone and lesser hematitic equivalents c) mafic volcanics: dark grey green to black pillow lavas thin massive flows, local pillow breccia, tuff, lapilli tuff, chert and/or siliceous, calcareous mudstone and hyaloclastites; d) felsic volcanics: light tan to grey, thinly bedded to massive ash, crystal tuff, welded tuff and infrequent thin flows; e) dark grey to black siliceous siltstone and associated heterolithic volcanogenic conglomerate or breccia; locally contains felsic tuff, rhyolite, mafic volcanic, diorite T and siliceous siltstone fragments f) massively bedded quartz arenite (similar to Upper Member)

ORDOVICIAN

MEGUMA GROUP

EOu HALIFAX FORMATION: a) medium to dark grey, thinly bedded to laminated siltstone and slate with sandy siltstone and very fine arenaceous laminae b) spotted slate to hornfels c) hornfels with local paragneissic banding at granite contacts d) pyritic siltstone and slate

EOg GOLDENVILLE FORMATION: quartzite; minor siltstone (Not mapped in Study Area)

SYMBOLS

Geological Boundaries

defined

approximate

assumed

interpreted from aeromagnetics

anticline (defined, assumed)

syncline (defined, assumed)

approximate hematite zone limit

approximate hematite zone limit

limit of mapping

trench, short

mine, quarry

diamond drill hole, report reference number

mineral occurrence

reference number

outcrop, sample number

outcrop, area

boulders, float

fault defined, approximate

fossil location

bedding: facing

inclined, vertical

layering: in lavas, tuffs, inclined, vertical

pillowed flows: facing unknown, inclined, vertical

pillowed flows: facing known, inclined, vertical

S1 cleavage or foliation inclined, vertical

S1 cleavage or foliation inclined, vertical

shear: dextral, sinistral inclined, vertical

intersection lineation: S0/S1 plunge indicated S0/S2

dike: inclined, vertical

joint: inclined, vertical

quartz vein: inclined, vertical

F1 fold axis: s, z, m

F2 fold axis; crenulation axis: s, z, m

plunge indicated

glacial striae: direction known, unknown

Abbreviations

Py	pyrite	Sul	sulphide
Po	pyrrhotite	Qv	quartz vein
Hem	hematite	U	uranium
Cpy	chalcopyrite	Cu	copper
Gn	garnet	Ba	barium
Feld	feldspar	Zn	zinc
Mg	magnetite	Au	arsenic
Tour	tourmaline	Ag	gold
Bi	biotite	Mo	molybdenite
Musc	muscovite	W	wolframite
Ep	epidote	Bm	barium
Chl	chlorite	Co	cobalt
Asp	arsenopyrite	Fe	iron
Qtz	quartz	Mn	manganese
Bx	brecciation	Al	aluminum
Ser	sericite	Pb	lead
		Ag	silver

South Mountain Batholith nomenclature from Horn and Macdonald, 1992.

NOTE See Report Page 4, Figure 2 For Inferred Stratigraphic Order of Lithologic Subunits

REFERENCES

H.M. L.L. MACDONALD, M.A. 1992. Geological Map of Gaspeau Lake. Nova Scotia Dept. of Natural Resources. Map 82-1.

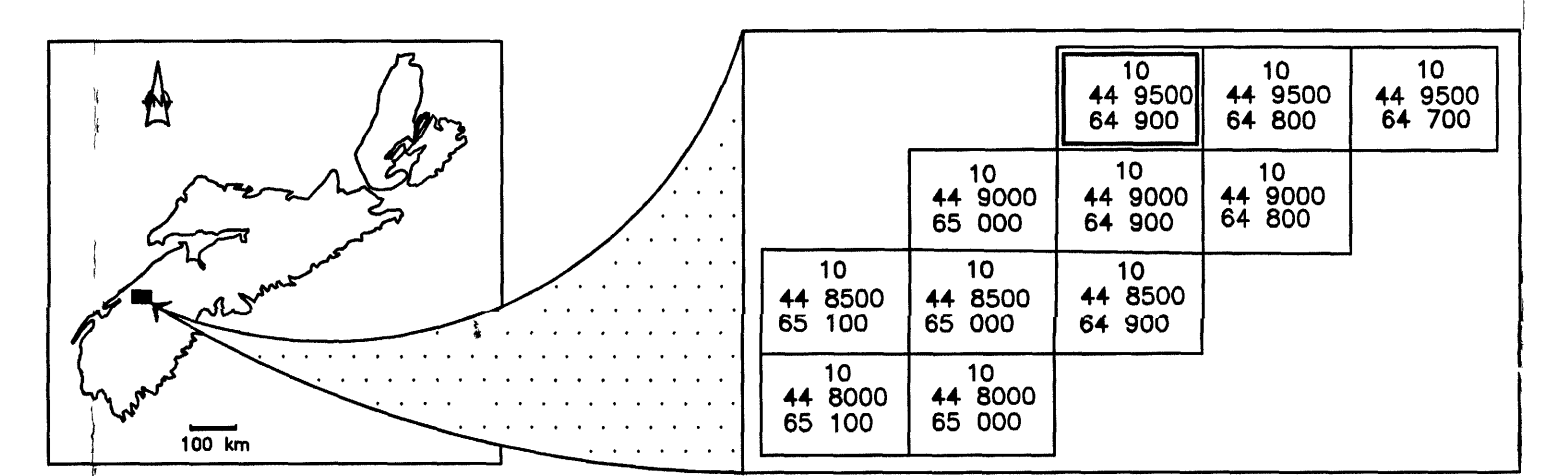
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Grid North at Centre of Sheet 7° 23' 3"

Magnetic Declination in 1987 20' 39"

Primary Reference Grid Nova Scotia 3° M.T.M.

Projected Base on Average Terrestrial System

1977 Datum

NOVA SCOTIA DEPARTMENT OF NATURAL RESOURCES

Sheet 44 9500 64 900

SILURIAN METALLOGENIC PROJECT

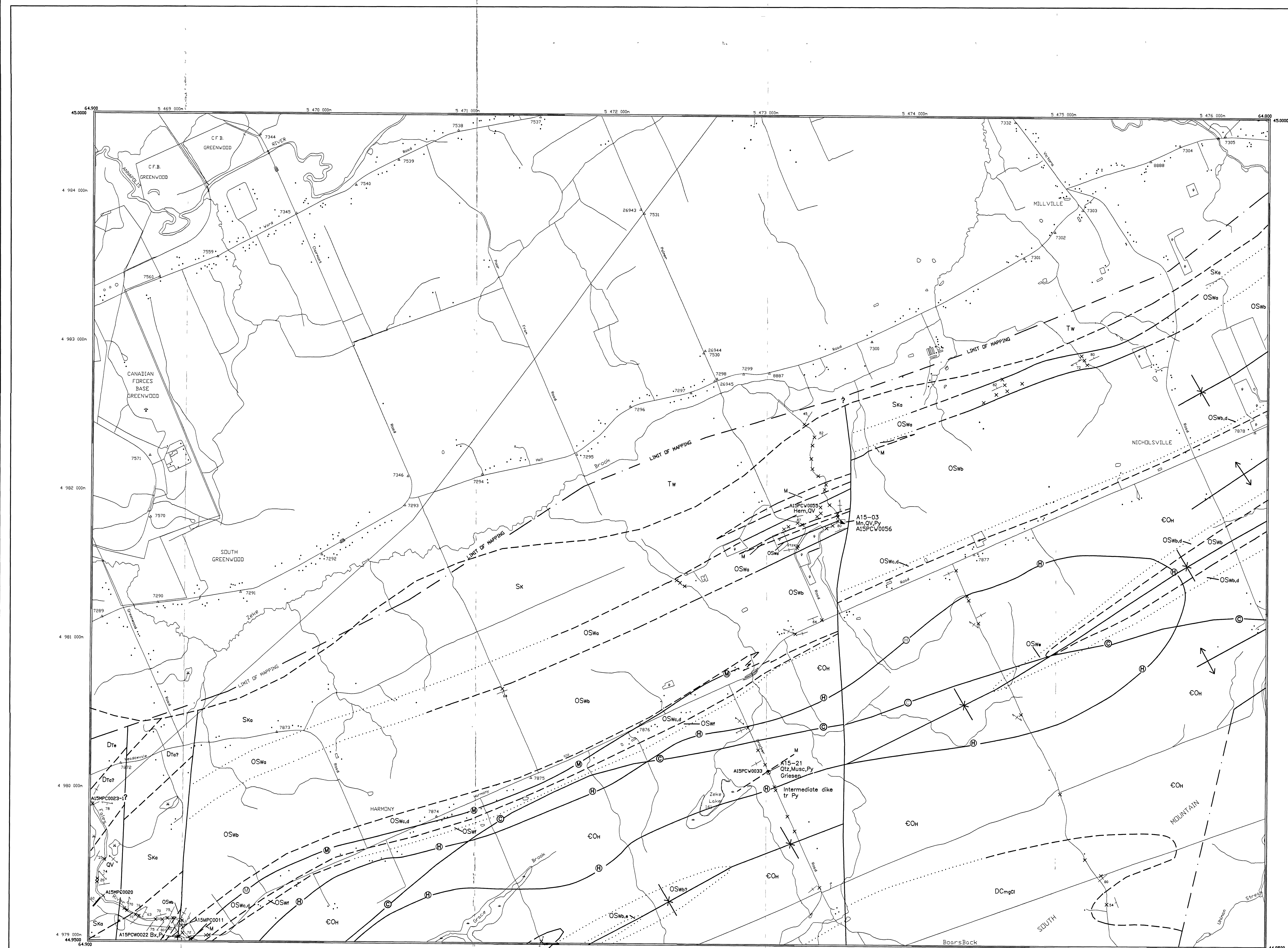
GREENWOOD

ANNAPOLIS COUNTY, NOVA SCOTIA

M.P. CULLEN, P. C. WEBSTER, A.B. HUDGINS,

SCALE 1 : 10 000

100 0 500 1000 metres



GEOLOGICAL LEGEND

INTRUSIVE ROCKS

DEVONIAN

DC **SOUTH MOUNTAIN BATHOLITE**: Includes granodiorite, monzogranite, granite, leucomonzogranite

DCmt **Highville Leucomonzogranite**: buff, white to pink or orange, equigranular to megacrystic, 3-13% muscovite, 2-7% biotite

DCgss **Cloud Lake Monzogranite**: light to medium grey, slightly megacrystic, 12-15% biotite, trace muscovite

DCgt **Song Lake Granodiorite**: light to medium grey, fine to coarse grain locally megacrystic, 10-18% biotite, trace muscovite

M **Granodiorite and undivided granitoid phases**

Geology and diorite sills and dikes: age range of pre Upper Silurian to post Upper Devonian

STRATIFIED ROCKS

TRIASSIC

Tw **WOLFVILLE FORMATION**: predominantly reddish brown to pale grey arkosic sandstone and minor pebbly arkose and shale

Lower Devonian

Dte **TORBROOK FORMATION**: a) predominantly thinly bedded grey siltstone and sandy siltstone with interbedded grey to brown quartz arenites near base, locally coquinitic b) medium to dark grey, thinly bedded siliceous and/or calcareous or phosphatic siltstone and grey to black silty limestone, locally fossiliferous c) bedded quartzite iron deposits with magnetite and/or hematite, locally oolitic and/or coquinitic d) dark grey to black siliceous siltstone and associated heterolithic volcanogenic conglomerate or breccia e) thinly interbedded red quartz wacke, sandy siltstone and shale with frequent grey interbeds, fossiliferous to coquinitic locally

SILURIAN

Upper: Silurian

Sk **KENTVILLE FORMATION**: a) fine grained, thinly laminated to thinly bedded, medium to dark grey or black siltstone and slate with minor interbedded quartz wacke; b) dark grey to black granitic shale and infrequent volcanogenic siltstone or tuff interbeds near Torbrook Formation contact

Upper: Silurian or Earlier

OSw **WHITE ROCK FORMATION**

Upper Member: a) fine grained massive to thickly bedded quartz arenite plus interbedded dark grey and red, thinly bedded to laminated siliceous siltstone and sandy shale, locally with very thin volcanogenic wacke or tuff interbeds; equivalent to "Double Quartzite" unit of Smithers (1975)

Lower Member: b) light grey green, medium to thick bedded quartz arenites with interbedded grey shale, grey laminated siltstone and lesser heterolithic equivalents c) mafic volcanics: dark grey green to black pillow lavas thin massive flows, local pillow breccia, tuff, lapilli tuff, chert and/or siliceous, calcareous mudstone and hyaloclastite; d) felsic volcanics: light tan to grey, thinly bedded to massive ash, crystal tuff, welded tuff and infrequent thin flows; e) dark grey to black siliceous siltstone and associated heterolithic volcanogenic conglomerate or breccia; locally contains felsic tuff, mylonite, mafic volcanic, diorite ? and siliceous siltstone fragments f) massively bedded quartz arenite (similar to Upper Member)

ORDOVICIAN

MEGUMA GROUP

COH **HALIFAX FORMATION**: a) medium to dark grey, thinly bedded to laminated siltstone and slate with sandy siltstone and very fine arenaceous laminae b) spotted slate to horrefels c) horrefels with local paragneissic banding of granite contacts d) partitic siltstone and slate

COg **GOLDENVILLE FORMATION**: quartzite; minor slate (Not mapped in Study Area)

SYMBOLS

Geological Boundaries

— defined

- - - approximate

... assumed

⊙ interpreted from aeromagnetics

— anticline (defined, assumed)

— syncline (defined, assumed)

⊙ approximate hornfels zone limit

⊙ approximate hematite zone limit

— limit of mapping

— trench, short

✕ mine, quarry

⊙ diamond drill hole, report reference number

✕ mineral occurrence, reference number

✕ outcrop, sample number

⊙ outcrop, area

⊙ boulders, float

— fault defined, approximate

⊙ fossil location

— bedding: facing

— inclined, vertical

— layering: in lavas, tuffs

— inclined, vertical

— allowed flows: facing unknown, inclined, vertical

— allowed flows: facing known, inclined, vertical

— S1 cleavage or foliation

— inclined, vertical

— S1 cleavage or foliation

— inclined, vertical

— shear: dextral, sinistral

— inclined, vertical

— intersection lineation: S0/S1

— plunge indicated: S0/S2

— dikes: inclined, vertical

— joint: inclined, vertical

— quartz vein: inclined, vertical

— F1 fold axis: s, z, m

— F2 fold axis: crenulation axis: s, z, m

— plunge indicated

— glacial strike: direction known, unknown

Abbreviations

Py	pyrite	Sul	sulphide
Po	pyrrhotite	QV	quartz vein
Hem	hematite	Ou	copper
Cpy	chalcocypite	U	uranium
Gr	galena	Ba	barium
Feld	feldspar	Zn	zinc
Msp	magnetite	As	arsenic
Tour	tourmaline	Au	gold
Bi	biotite	Mo	molybdenite
Musc	muscovite	W	wolframite
Epid	epidote	Bl	blanckite
Chl	chlorite	Co	cobalt
Aspy	arsenopyrite	Fe	iron
Qtz	quartz	Mn	manganese
Bx	brecciation	Si	silicification
Sr	sericite	Pb	lead
		Ag	silver

⊙ South Mountain Batholith nomenclature from Horn and MacDonald, 1992.

* NOTE: See Report Page 6, Figure 2 For Inferred Stratigraphic Order of Lithologic Subunits

REFERENCES

HALL, L.J., MACDONALD, M.A. 1992. Geological Map of Gaspeanu Lake. Nova Scotia Dept. of Natural Resources. Map 92-1.

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100 km

Grid North at Centre of Sheet 0° 23' 3"

Magnetic Declination in 1987 20° 39'

Primary Reference Grid Nova Scotia 3° M.T.M.

Projected Base on Average Terrestrial System 1977 Datum

NOVA SCOTIA DEPARTMENT OF NATURAL RESOURCES

Sheet 44 9500 64 800

SILURIAN METALLOGENIC PROJECT

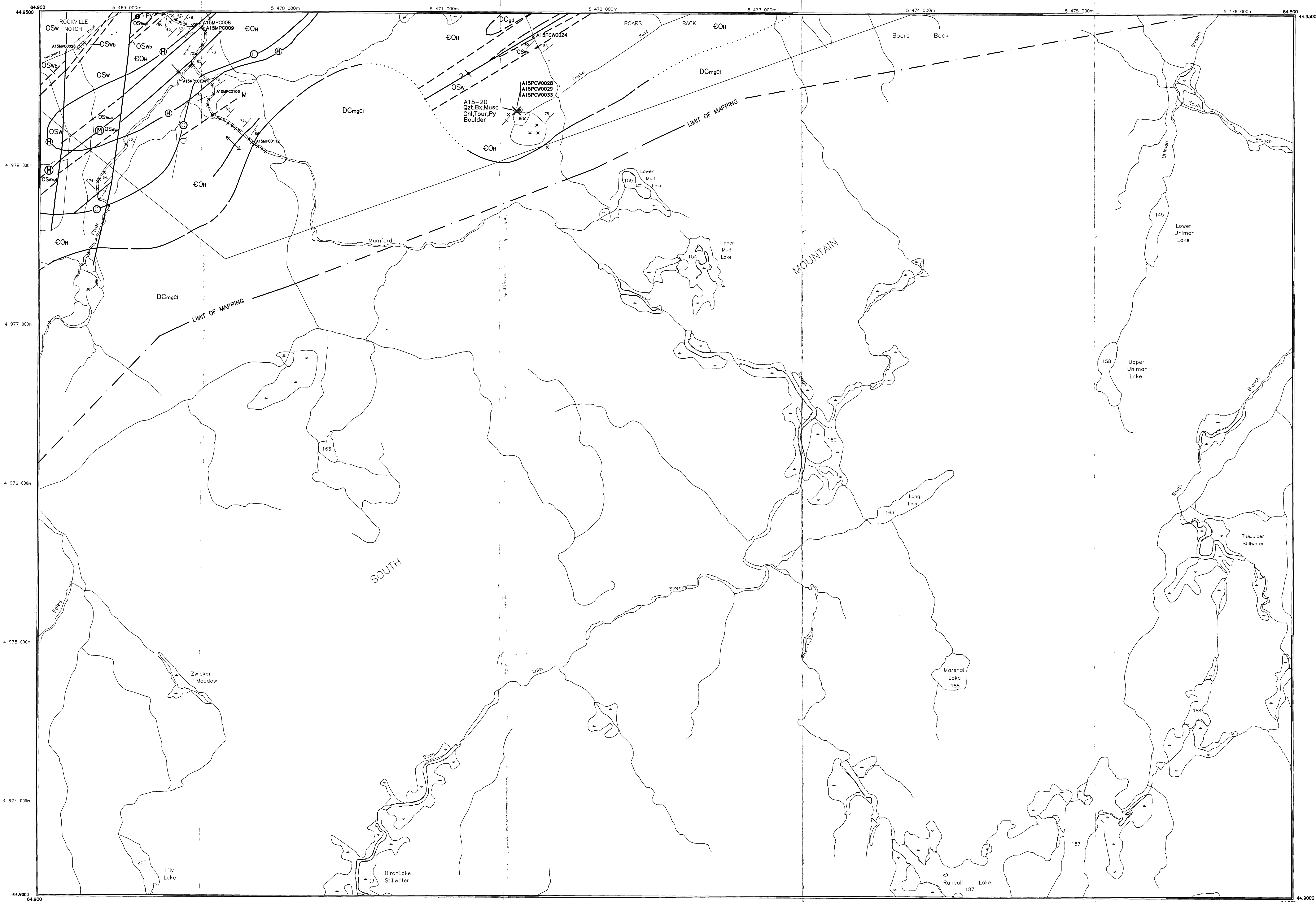
SOUTH GREENWOOD

ANNAPOLIS COUNTY, NOVA SCOTIA

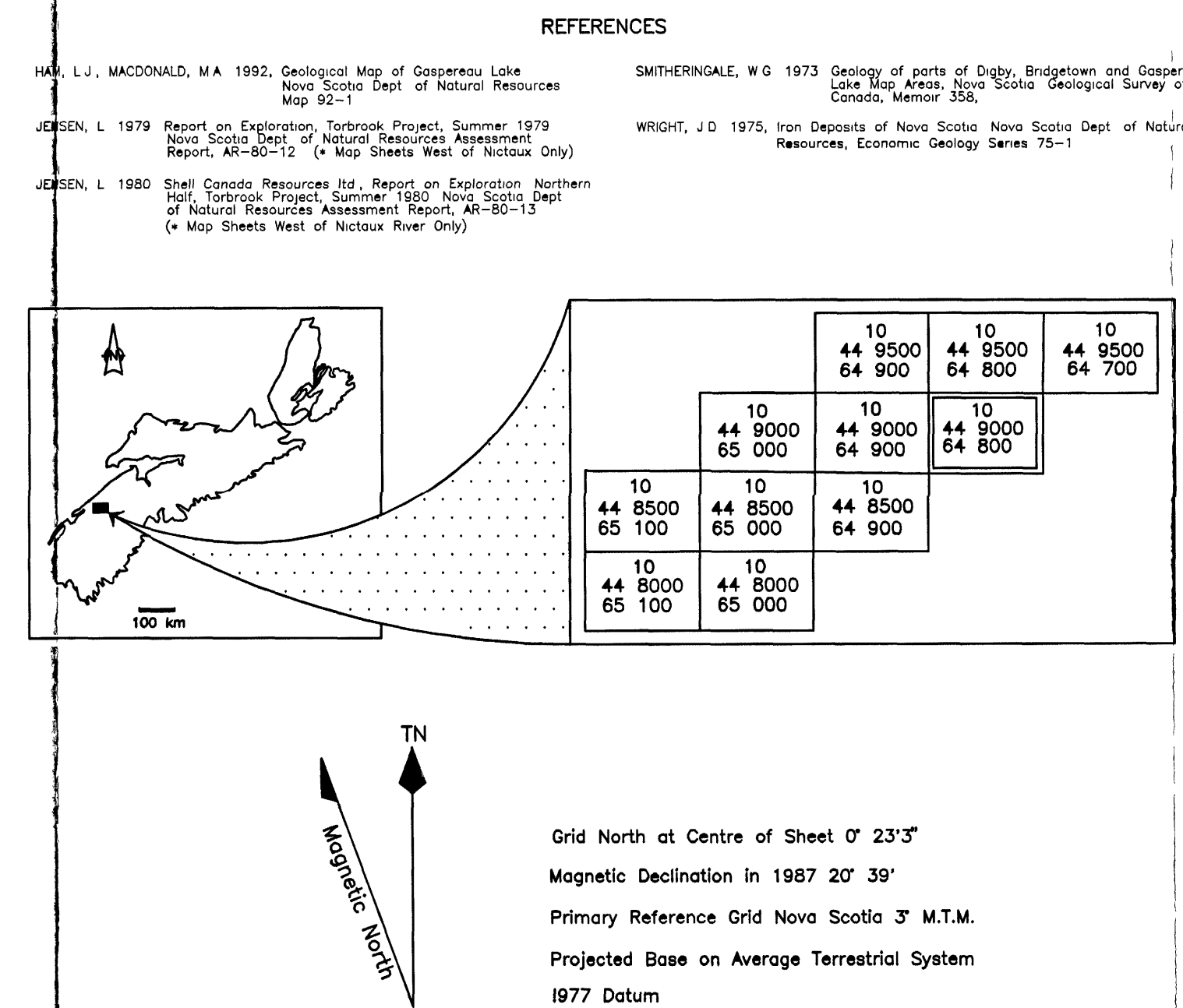
M.P. CULLEN, P. C. WEBSTER, A.B. HUGGINS,

SCALE 1 : 10 000

100 0 500 1000 metres



- GEOLOGICAL LEGEND**
- INTRUSIVE ROCKS**
- DEVONIAN**
- DC Middle to Upper Devonian
- DCmi South Mountain Batholith: includes granodiorite, monzonite, granite, leucogranite, and quartzite; 3-13% muscovite, 2-7% biotite
- DCmg Cloud Lake Monzonite: light to medium grey, slightly megacrystic, 12-15% biotite, trace muscovite
- DCgs Scrag Lake Granodiorite: light to medium grey, fine to coarse grain locally megacrystic, 10-15% biotite, trace muscovite
- DCgd Granodiorite and undivided granitoid phases
- M Gabbro and diabase sills and dikes; age ranges of pre Upper Silurian to post Upper Devonian
- STRATIFIED ROCKS**
- TRIASSIC**
- TW WOLFVILLE FORMATION: predominantly reddish brown to pale grey arenaceous sandstone and minor pebbly arkose and shale
- Lower Devonian**
- Dr TORBROOK FORMATION: a) predominantly thinly bedded grey siltstone and sandy siltstone with interbedded grey to brown quartz arenite near base, locally calcareous and/or calcareous or phosphatic siltstone and grey to black silty limestone, locally fossiliferous; b) bedded quartzitic iron deposits with magnetite and/or hematite; locally calcareous and/or calcareous; c) dark grey to black siliceous siltstone and associated heterolithic volcanogenic conglomerate or breccia; d) thinly interbedded red quartz siltstone, sandy siltstone and shale with frequent grey interbeds; fossiliferous to coquinitic locally
- SILURIAN**
- Upper Silurian
- Sk KENTVILLE FORMATION: a) fine grained, thinly laminated to thinly bedded, medium to dark grey or black siltstone and slate with minor interbedded quartz wackes; b) dark grey to black granitic shale and frequent volcanogenic siltstone or tuff interbeds near Torbrook contact
- Upper Silurian or Earlier
- OSw WHITE ROCK FORMATION: a) fine grained massive to thickly bedded quartz arenite plus interbedded dark grey and red, thinly bedded to laminated siliceous siltstone and sandy shale; locally with very thin volcanogenic wackes or tuff interbeds; equivalent to "Double Quartzite" unit of Smithers (1973)
- Lower Member: b) light grey green, medium to thick bedded quartz arenites with interbedded grey shale, finely laminated siltstone and lesser hematitic equivalents
- c) mafic volcanics: dark grey green to black pillow lavas thin massive flows, local pillow breccia, tuff, lapilli tuff, and/or and/or siliceous, calcareous mudstone and hydroclastic; d) felsic volcanics: light tan to grey, thinly bedded to massive ash, crystal tuff, welded tuff and infrequent thin flows; e) dark grey to black siliceous siltstone and associated heterolithic volcanogenic conglomerate or breccia; locally contains felsic tuff, rhyolite, mafic volcanic, diorite ? and siliceous siltstone fragments
- f) massively bedded quartz arenite (similar to Upper Member)
- ORDOVICIAN**
- MEGUMA GROUP
- EQH HALIFAX FORMATION: a) medium to dark grey, thinly bedded to laminated siltstone and slate with sandy siltstone and very fine arenaceous lamine
- b) spotted slate to hornfels c) hornfels with local paragneissic banding at granite contacts
- d) pyritic siltstone and slate
- EQG GLOUCESTER FORMATION: quartzite; minor slate (Not mapped in Study Area)
- SYMBOLS**
- Geological Boundaries
- defined
- approximate
- assumed
- interpreted from aeromagnetics
- anticline (defined, assumed)
- syncline (defined, assumed)
- approximate hornfels zone limit
- approximate hematite zone limit
- limit of mapping
- trench, shaft
- mine, quarry
- diamond drill hole
- report reference number
- mineral occurrence, reference number
- outcrop, area
- sample number
- outcrop, area
- boulders, float
- fault defined, approximate
- fossil location
- bedding: facing
- inclined, vertical
- layering: in lavas, tuffs
- inclined, vertical
- pillowed flows: facing unknown, inclined, vertical
- allowed flows: facing known, inclined, vertical
- S1 cleavage or foliation
- inclined, vertical
- S1 cleavage or foliation
- inclined, vertical
- shear: dextral, sinistral
- inclined, vertical
- intersection lineation: S0/S1
- plunge indicated S0/S2
- dike: inclined, vertical
- joint: inclined, vertical
- quartz vein: inclined, vertical
- F1 fold axis: s, z, m
- F2 fold axis: enclination axis: s, z, m
- plunge indicated
- glacial strike: direction known, unknown
- Abbreviations**
- | | | | |
|------|--------------|-----|----------------|
| Py | pyrite | Sul | sulphide |
| Po | pyrrhotite | Qz | quartz vein |
| Hem | hematite | Cu | copper |
| Cpy | chrysotile | U | uranium |
| Ga | galena | Ba | barium |
| Feld | feldspar | Zn | zinc |
| Mag | magnetite | As | arsenic |
| Tour | tourmaline | Au | gold |
| Bi | biotite | Mo | molybdenite |
| Musc | muscovite | W | wolframite |
| Epid | epidote | Bl | blende |
| Chl | chlorite | Cu | copper |
| Aspy | arsenopyrite | Fe | iron |
| Qtz | quartz | Mn | manganese |
| Bx | brecciation | Stl | silicification |
| Ser | sericite | Pb | lead |
| | | Ag | silver |
- South Mountain Batholith nomenclature from Ham and MacDonald, 1992.
- * NOTE See Report Page 4, Figure 2 For Inferred Stratigraphic Order of Lithologic Subunits



NOVA SCOTIA DEPARTMENT OF NATURAL RESOURCES

Sheet 44 9000 64 800

SILURIAN METALLOGENIC PROJECT

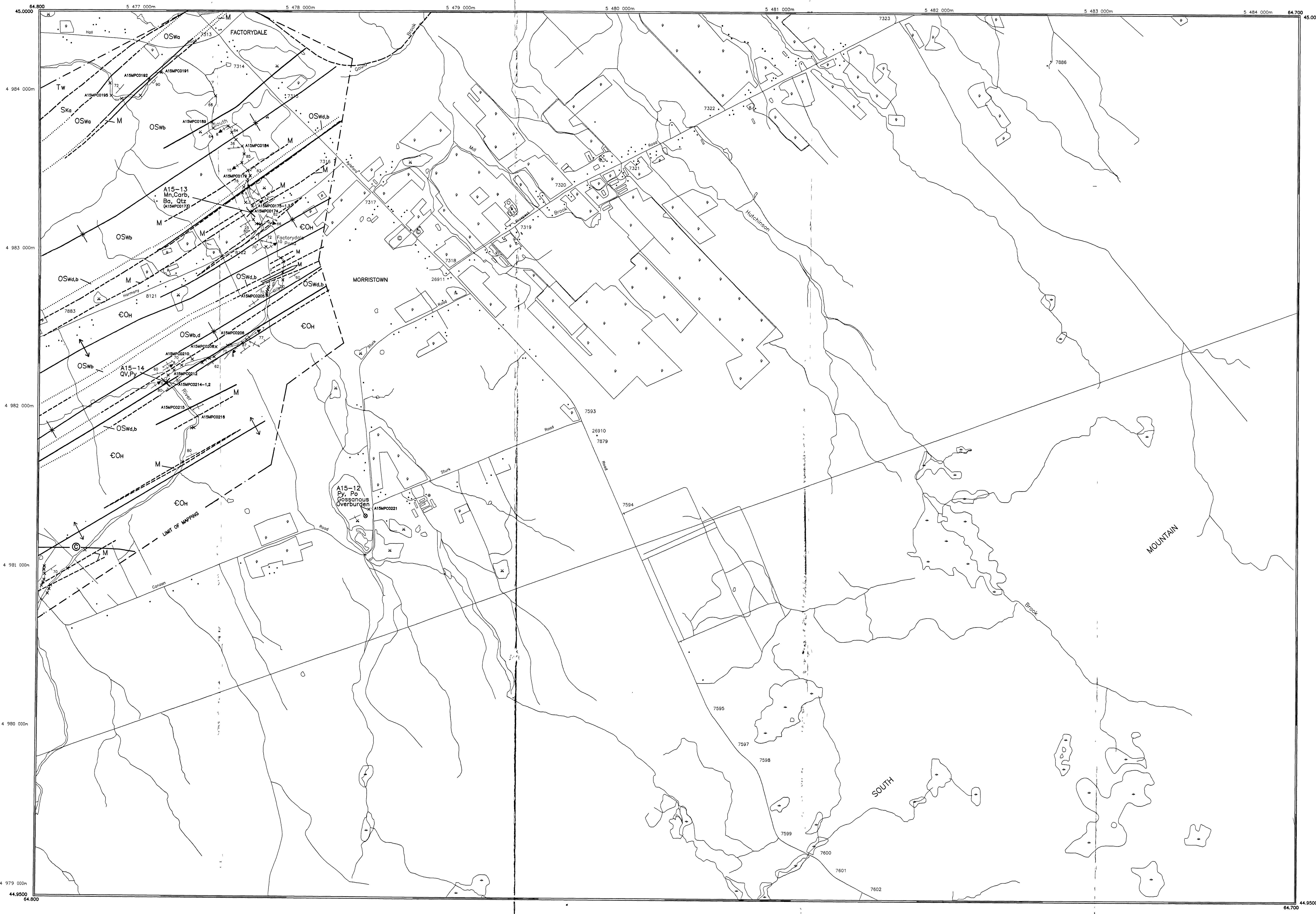
MUMFORD BROOK

ANNAPOLIS COUNTY, NOVA SCOTIA

M.P. CULLEN, P. C. WEBSTER, A.B. HUDGINS,

SCALE 1 : 10 000

100 0 500 1000 metres



GEOLOGICAL LEGEND

INTRUSIVE ROCKS

DEVONIAN

Middle to Upper Devonian

DC South Mountain Batholith: includes granodiorite, monzogranite, granite, leucomonzogranite

DCM Inglisville Leucomonzogranite: buff, white to pink or orange, equigranular to megacrystic, 3-13% muscovite, 2-7% biotite

DCMg Cloud Lake Monzogranite: light to medium grey, slightly megacrystic, 12-15% biotite, trace muscovite

DCgSg Scrog Lake Granodiorite: light to medium grey, fine to coarse grain locally megacrystic, 10-18% biotite, trace muscovite

DCgG Granodiorite and undivided granitoid phases

M Gabbro and diabase sills and dikes; age range of pre Upper Silurian to post Upper Devonian

STRATIFIED ROCKS

TRIASSIC

TW WOLFVILLE FORMATION: predominantly reddish brown to pale grey arkose sandstone and minor pebbly arkose and shale

Lower Devonian

Dr TORBROOK FORMATION: a) predominantly thinly bedded grey siltstone and sandy siltstone with interbedded grey to brown quartz arenite near base; locally coarsitic b) medium to dark grey, thinly bedded siliceous and/or calcareous or phosphatic siltstone and grey to black silty limestone; locally fossiliferous; c) bedded quartzitic iron deposits with magnetite and/or hematite; locally oolitic and/or coarsitic d) dark grey to black siliceous siltstone and associated heterolithic volcanogenic conglomerate or breccia e) thinly interbedded red quartz wacke, sandy siltstone and shale with frequent grey interbeds; fossiliferous to coarsitic locally

SILURIAN

Upper Silurian

SK KENTVILLE FORMATION: a) fine grained, thinly laminated to thinly bedded, medium to dark grey or black siltstone and slate with minor interbedded quartz wacke; b) dark grey to black graphitic shale and infrequent volcanogenic siltstone or tuff interbeds near Torbrook Formation contact

Upper Silurian or Earlier

OSW WHITE ROCK FORMATION: Upper Member: a) fine grained massive to thickly bedded quartz arenite plus interbedded dark grey and red, thinly bedded to laminated siliceous siltstone and sandy shale; locally with very thin volcanogenic wacke or tuff interbeds; equivalent to "Double Quartzite" unit of Smithers (1973) Lower Member: b) light grey green, medium to thick bedded quartz arenites with interbedded grey shale, finely laminated siltstone and lesser hematitic equivalents c) mafic volcanics: dark grey green to black pillow lavas thin massive flows, local pillow breccia, tuff, lapilli tuff, chert and/or siliceous, calcareous mudstone and hyaloclastite; d) felsic volcanics: light tan to grey, thinly bedded to massive ash, crystal tuff, welded tuff and infrequent thin flows; e) dark grey to black siliceous siltstone and associated heterolithic volcanogenic conglomerate or breccia; locally contains felsic tuff, rhyolite, mafic volcanic diorite? and siliceous siltstone fragments f) massively bedded quartz arenite (similar to Upper Member)

ORDOVICIAN

MEGUMA GROUP

EOH HALIFAX FORMATION: a) medium to dark grey, thinly bedded to laminated siltstone and slate with sandy siltstone and very fine arenaceous laminae b) spotted slate to hornfels c) hornfels with local paragneissic banding at granite contacts d) pyritic siltstone and slate

EOG GOLDENVALE FORMATION: quartzite; minor slate (Not mapped in Study Area)

SYMBOLS

Geological Boundaries

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○ interpreted from aeromagnetics

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✕ mine, quarry

✕ diamond drill hole, report reference number

✕ mineral occurrence, reference number

✕ outcrop, sample number

✕ outcrop, fault

○ boulders, float

○ fossil location

|| bedding: facing inclined, vertical

|| layering: in lavas, tuffs, inclined, vertical

|| pillowed flows: facing unknown, inclined, vertical

|| pillowed flows: facing known, inclined, vertical

|| S1 cleavage or foliation inclined, vertical

|| S1 cleavage or foliation inclined, vertical

|| shear: dextral, sinistral inclined, vertical

|| intersection lineation: S0/S1 plunge indicated S0/S2

|| dike: inclined, vertical

|| joint: inclined, vertical

|| quartz vein: inclined, vertical

|| F1 fold axis: s, z, m

|| F2 fold axis: orientation axis: s, z, m plunge indicated

|| glacial striae: direction known, unknown

Abbreviations

Py	pyrite	Sul	sulphide
Po	pyrrhotite	Qz	quartz vein
Hem	hematite	Cu	copper
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Mg	magnetite	As	arsenic
Mo	molybdenite	W	wolframite
Ep	epidote	Bi	blennite
Chl	chlorite	Co	cobalt
Aspy	arsenopyrite	Fe	iron
Qtz	quartz	Mn	manganese
Sil	silicification	Si	silica
Ser	sericite	Pb	lead
Ag	silver		

○ South Mountain Batholith nomenclature from Ham and MacDonald, 1992.

• NOTE: See Report Page 4, Figure 2 For Inferred Stratigraphic Order of Lithologic Subunits

REFERENCES

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SILURIAN METALLOGENIC PROJECT

MORRISTOWN

ANNAPOLIS COUNTY, NOVA SCOTIA

M.P. CULLEN, P. C. WEBSTER, A.B. HUDGINS,

SCALE 1 : 10 000

100 0 500 1000 metres

11