Dowling member

Garson member

Sandcherry member

Base metal (Zn, Cu, Pb) sulfide occurrences and deposits

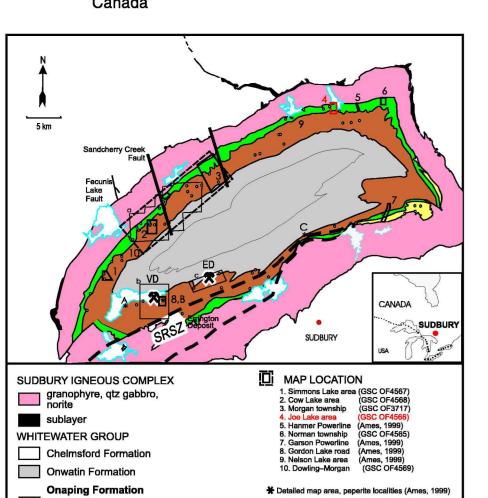


Figure 1. Location and general geology map illustrating the regional distribution of the members of the Onaping Formation. VD, ED = Vermilion and Errington Zn-Pb-Cu-Ag deposits. SRSZ = South Range shear zone.

A) A+M showing B) Gordon Lake Road
 C) Azilda

Other Whitewater Group Map Areas

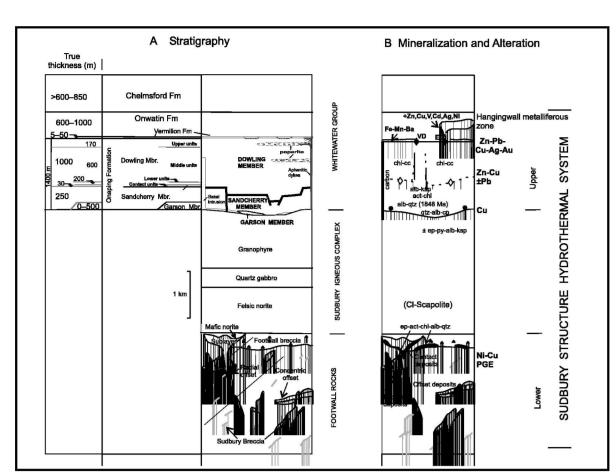
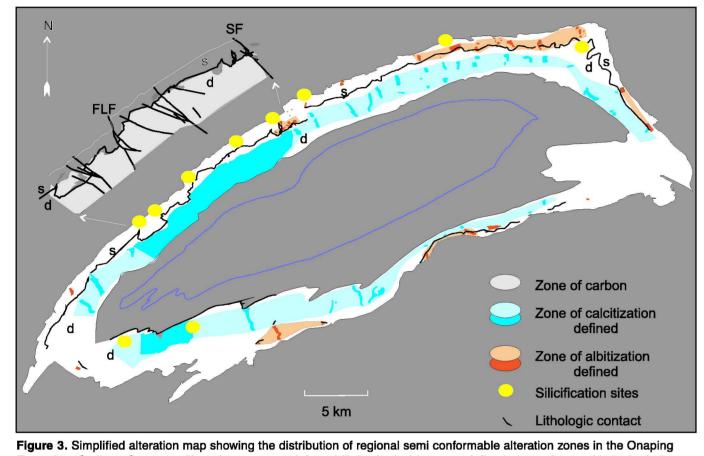
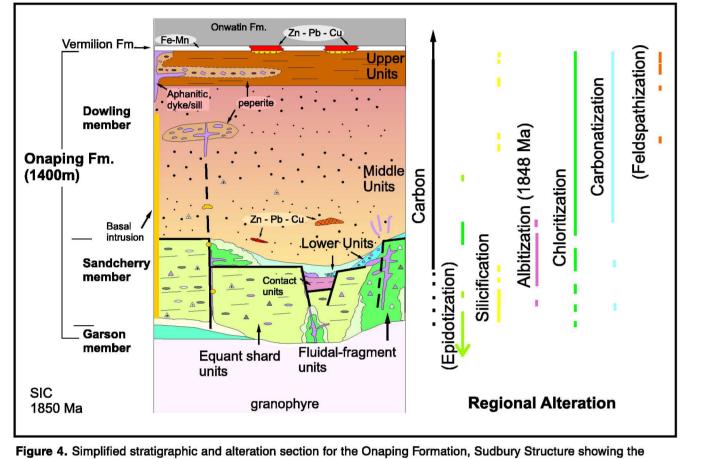


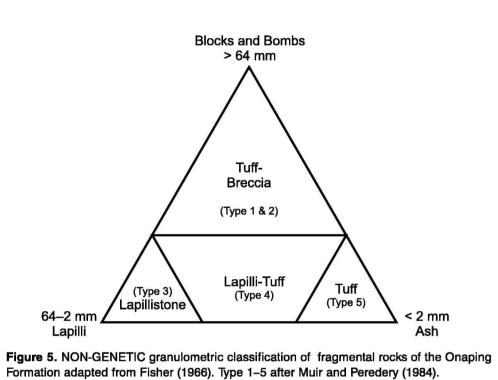
Figure 2. Schematic sections through the Sudbury structure showing: A) Stratigraphic terminology with member and unit thicknesses. The fragmental rocks are intruded by fine grained aphanitic dykes and the xenolithic basal intrusion; B) Distribution of mineralization and alteration, Sudbury structure hydrothermal system. VD, ED = Vermilion and Errington Zn-Pb-Cu-Ag deposits. (Modified after Ames et al., 2002).



Formation, Sudbury Structure. Alteration zones are inferred (light shades) between defined mapped areas (dark shades). S = Sandcherry member, D = Dowling member. Note the transgressive nature of the carbon contact across the Sandcherry/Dowling member contact on inset map. Data compiled from this study, unpublished Falconbridge Ltd. Data, Gibbins, 1994, and Gray, 1995.



distribution and vertical stacking of regional basinwide hydrothermal alteration zones. Brackets denote alteration types with poorly constrained regional distribution patterns (modified from Ames et al., 1998).



**SUMMARY OF MAP AREAS, ONAPING FORMATION** 

MAP SCALE REFERENCE Complete stratigraphic section through north range Onaping Fmn. Type area Stratigraphic: dominance of fluidal breccias in SM, abundant syn-depositional fault control of units block faulting. 1:5000 **GSC OF3717** Unstable SM depositional environment, DM contact units and DM lower units, stable geotectonics during DMM (Ames and and DMUU deposition. Syndepositional dyke emplacement into DMCT. Reappearance of water in upper DMMU Gibson, 2004) North Range Alteration: basal zone of silicification overprints albitization. Feldspar alteration localized around fluidal brecciadyke-sill complexes, weak- moderate albitization. Carbon transgresses DM-SM stratigraphic contact. Carbonate (calcite alteration) in upper 2/3rd of OF, with local discordant calcite-absent zones associated with fracturecontrolled silicification and mineralization Mineralization: Limerick Cu-Zn showing Stratigraphic: Section through Dowling member lower units and middle units, scorea beds **GSC OF4568** Alteration: regional carbonate, carbon and disseminated sulphide. (Ames and Gibson, 2004) Mineralization: McNunes and Cow Lake Cu-Zn showings cpy-po in amygdales in basal intrusion near top of MU. Stratigraphic: section through DMCT and DMLU thin N/S magnetite-rich mafic dyke abundant intrusions (Basal **GSC OF4567** North Range Alteration: Epidote-pyrite-BaKsp zone at DMCT/LU interface, strong carbonate alteration. (Ames and Gibson, 2004) Mineralization: Abundant disseminated po-cpy-sph associated with discordant basal intrusion pods Simmons Stratigraphic: section from granophyre SIC to DMLU, complete section through SM, intrusive fluidal-breccia 1:2000 **GSC OF4566** sill/dyke complex proximal facies, possible transported, slumped fluidal vent complex. Discordant intrusive unit (Ames and Gibson, 2004) Basal intrusion-former Basal Mbr. (Ames et al., 1997) North Range Alteration: Type area for Albitization. Regional syn-depositional albitization controlled by fluidal breccia complex, racture-controlled replacement albitization (1848 Ma). K-feldspar-quartz hydrothermal breccia-local alteration. (Ames et al., 1998) "Pocket" of carbon-bearing SM 10 m from granophyre contact 1848 + 3.8/-1.8 Ma Stratigraphic: SM to top of DMCT. Basal intrusion-discordant near base of exposed OFm. SM- numerous bombs, 1:2000 near DMCT abundant aphanitic dykes, excellent transect through DMCT units powerline North Range Alteration: Regional basal silicification zone in SM and BI. Increased albitization spatially associated with dykes. Fracture-controlled silicification x-cuts SM/DM contact Nelson Lk. West Stratigraphy: SM to DM. Two orientations of aphanitic dykes of same composition proximal fluidal breccia Figure A2-4.1e North Range Alteration: Intense albitization amphibole alteration of matrix at dyke terminations within SM units (Ames, 1999) (Ames, 1999) Alteration: Basal silicification zone North Range Mineralization: Unnamed base metal -py gossan Stratigraphic: near base of OFm in SM **GSC OF4565** Multiple textural phases of the basal intrusion, megabreccia discordant x-cuts fluidal complex (Ames and Gibson, 2004) excellent 3D view of dyke-sill complex Alteration: regional albitization, east side of lake carbon-bearing SM near the base of OFm. discordant zone of actinolite fractures and albite-quartz Stratigraphic: Dowling member below Vermilion Zn-Pb-Cu mine. DMUU and local setting for detailed mapping of peperite South Range peperite is extensive (~ 200 x 1000 m) (Ames, 1999) Stratigraphic: dyke intrusive into DMUU formation of blocky peperite Figures 2-12, A2-5.1 Gordon Lk Rd Alteration: peperite-associated silicification, phengitization, carbonatization Figure 4-13 (Ames, 1999) A&M showing specific carries and associated peperite formation, later intrusive andesite lobes Figures 2-12, A2-5.2 and 3 South Range formation or globular peperite

Alteration: peperite associated, silicification, chloritization, carbonatization and Fe-Mn oxides.

## SM - Sandcherry member EQ - Equant shard units FL - Fluidal fragment unit DM - Dowling member CT - Contact units LU - Lower units MU - Middle units UU - Upper units REFERENCES

Stratigraphic: upper 50 m of OFm.

dvkes with blocky peperite

Cow Lake base metal showing

McNunes base metal showing

Simmons base metal showing

Type area for Sandcherry member

Rvan base metal showing

**Detailed maps** 

peperite dykes with blocky peperite
South Range Alteration: peperite associated chloritization, phengitization, carbonatization.

p. 1541-1562.

Stratigraphic: 15 km strike length of North Range Onaping Fmn.

Falls. Regional carbonization in upper ~ 1 km of Onaping Formation.

Mineralization: Numerous replacement type Zn-Cu-Pb showings in DM.

from Windy Lake/Hwy 144 to the Sandcherry Creek Fault shows lateral distribution of units and members

Dowling-Morgan

Alteration: Carbon boundary transgresses SM-DM contact large unit of SM conductive Equant shard unit at High

Ames, D.E. and Gibson, H.L.

2004: Geology, alteration and mineralization of the Onaping Formation, Morgan Township, Sudbury Structure,
Ontario. 2 map sheets with descriptive notes, 8 figures, scale 1:5000, Geological Survey of Canada, Open File

(Falconbridge Ltd.)

**GSC OF4568** 

**GSC OF4568** 

**GSC OF4567** 

**GSC OF4569** 

Figure 5-2 (Ames, 1999)

1:200

1:2000 1:200 to 1:25

- 2004: Geology, alteration and mineralization of the Onaping Formation, Rockcut Lake area, Norman Township, Sudbury, Ontario. 1 sheet with 4 figures and 1 table, scale 1:2000, Geological Survey of Canada, Open File 2004: Geology, alteration and mineralization of the Onaping Formation, Joe Lake area, Wisner Township, Sudbury,
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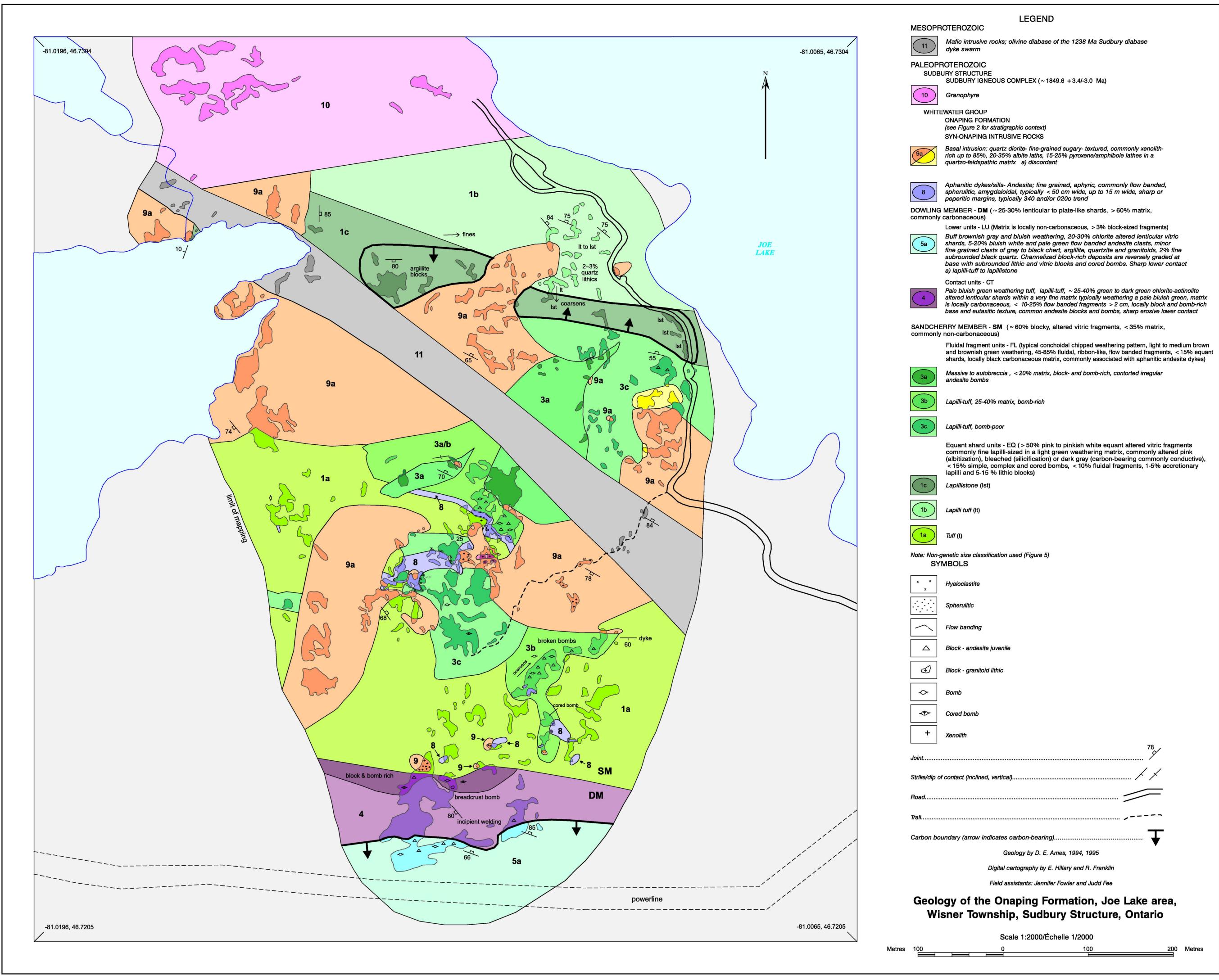
Sudbury Structure, (eds) E.G. Pye, A.J. Naldrett, and P.E. Giblin, Ontario Geological Survey, Special Vol. 1,

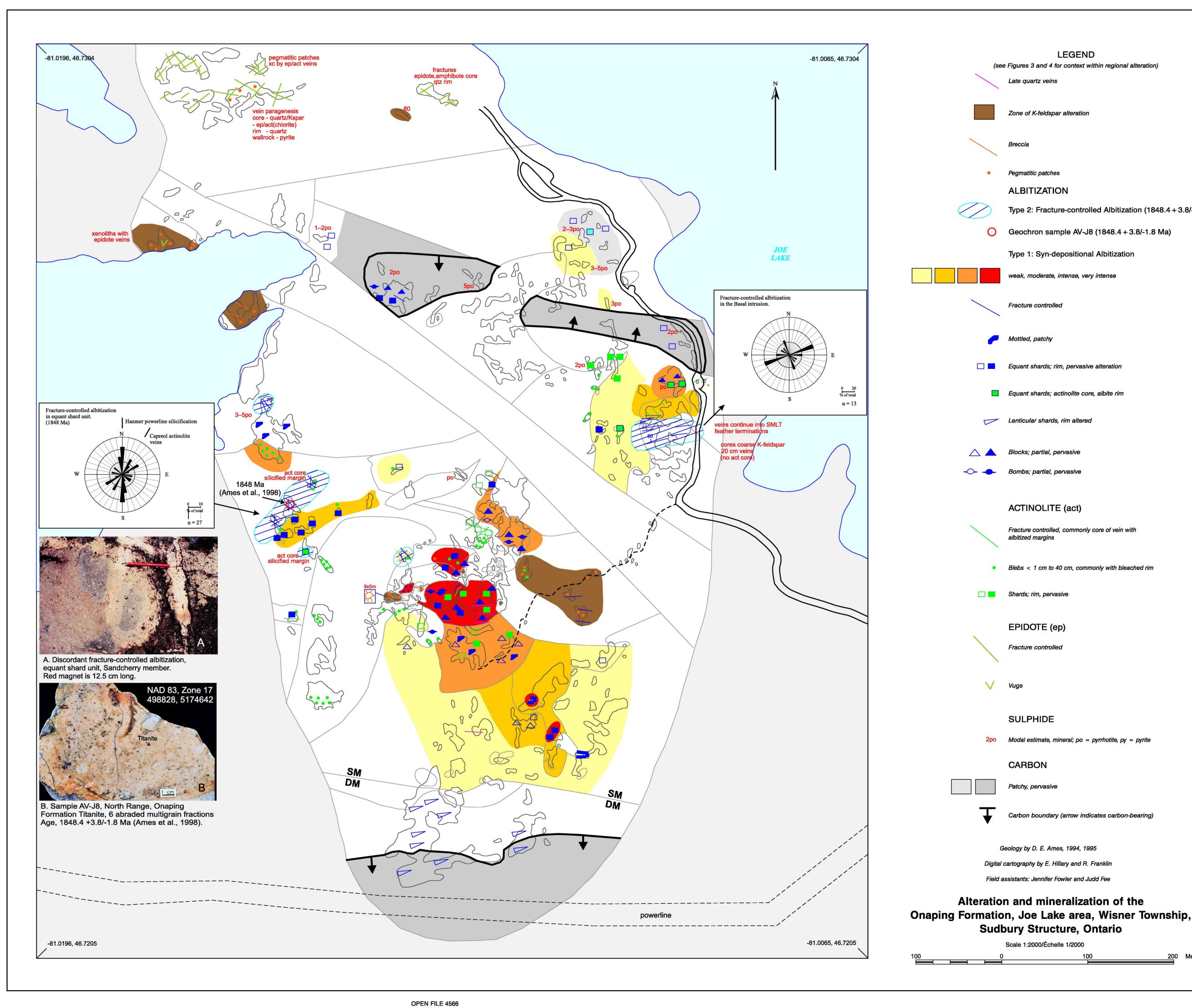
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Universal Transverse Mercator Projection

North American Datum1983 - Zone 17

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pas été soums au

processus officiel de publication de la CGC.

LEGEND

Type 1: Syn-depositional Albitization

weak, moderate, intense, very intense

Type 2: Fracture-controlled Albitization (1848.4 + 3.8/-1.8 Ma)

Late quartz veins

Pegmatitic patches

**ALBITIZATION** 

Fracture controlled

Bombs; partial, pervasive

ACTINOLITE (act)

EPIDOTE (ep)

Fracture controlled

SULPHIDE

**CARBON** 

Geology by D. E. Ames, 1994, 1995

Scale 1:2000/Échelle 1/2000

Carbon boundary (arrow indicates carbon-bearing)

Fracture controlled, commonly core of vein with

Zone of K-feldspar alteration