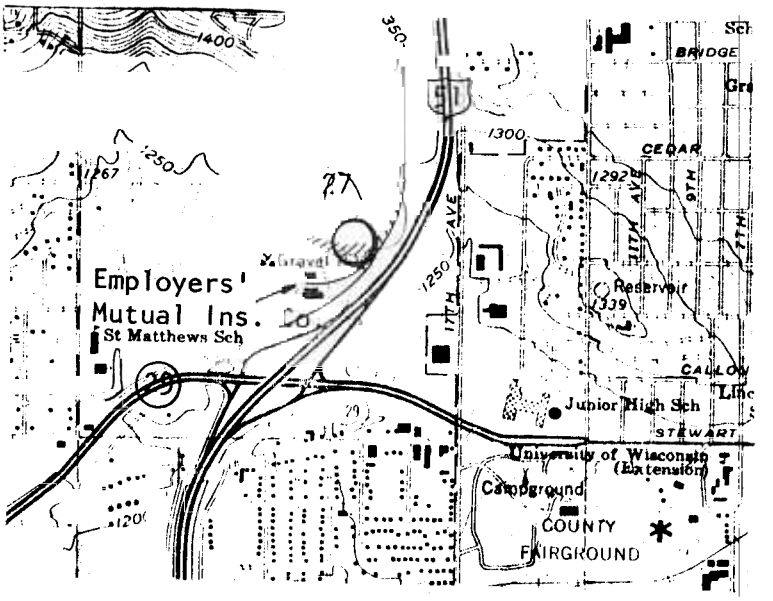
TITLE: Lensoidal Quartz Syenite, Employers' Mutual Insurance Company

LOCATION: NW 1/4, SE 1/4, Sec. 27, T 29 N, R 7 E, Wausau West 7.5' Quadrangle



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SUMMARY OF FEATURES:

Coarse-grained, pink and brownish gray quartz syenite contining up to 60 percent volcanic xenoliths (best seen on horizontal surfaces) is exposed in an old quarry behind the offices of Employers' Mutual Insurance Company. This rock exemplifies contaminated quartz syenite of the "intermediate zone" of the Wausau syenite pluton (Fig. 1.) Associated quartz syenite elsewhere in this zone contains large, metasomatized quartzite and/or mica schist xenoliths, the most spectacular of which is exposed on the summit of Rib Mountain. The Rib River "lineament" separates the two crescentic segments of the Wausau syenite body. The core and southern half of the syenite pluton are displaced by the Ninemile granite (1500 m.y.). Concentric xenolith orientation in both the Wausau and Stettin syenite plutons suggests laminar flow of viscous, water-deficient magma in volcanic pipes.

DESCRIPTION:

The quartz syenite at this location is composed of coarse perthite (80%), quartz (10%), and sodic pyroxene partially replaced by mixtures of dark green amphibole, carbonate, and magnetite (10%). Quartz is interstitial. Large magnetite segregations can be observed along the road on the east side of this outcrop.

The trachyte or rhyolite(?) xenoliths are lensoidal with blunt, broken east ends and rounded (assimilated?) west ends. Their orientation is consistently N 70-75° W, vertical in this area (Fig. 2), and they are seen best on horizontal surfaces. Large quartzite xenoliths occur in the quartz syenite along the ridge crest north of here. The crescentic form of this part of the Wausau syenite body also shows as a conspicuous magnetic anomaly owing to the high concentration of magnetite as sheets and lenses in these rocks. The xenoliths show up on fresh surfaces mainly as slightly finer grained, darker colored

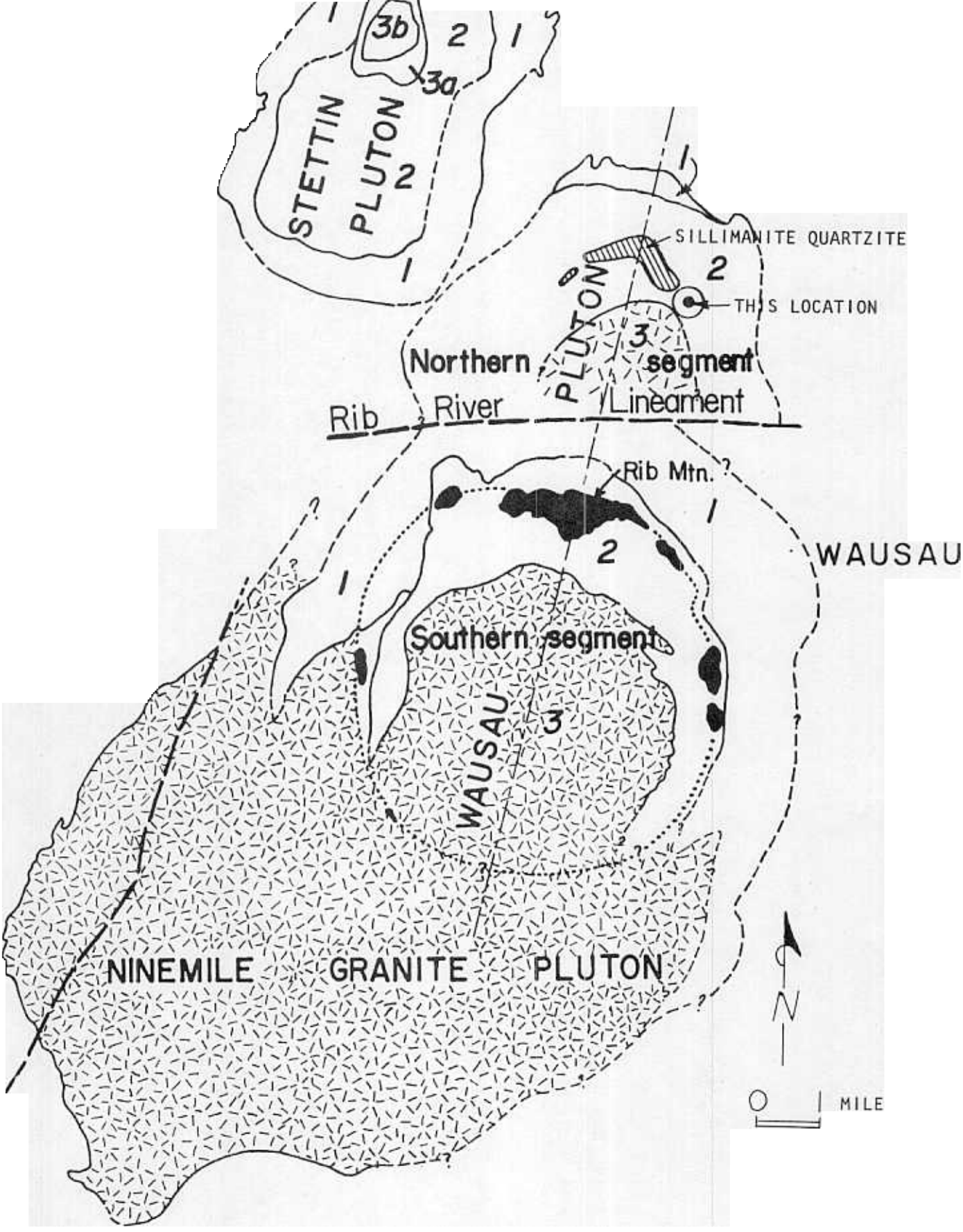

Figure 1 -- Generalized geologic map of the Stettin and Wausau syenite bodies and the Ninemile granite pluton which intrudes the Wausau syenite. Unit 1 is wall zone gneissic syenite, unit 2 is amphibole and pyroxene syenite of intermediate zone, and unit 3 is core zone. Black is quartzite.

masses. In addition to the angular volcanic xenoliths, the quartz syenite here contains mafic schlieren and clots showing irregular shape and orientation as well as gradational boundaries, a factor suggesting more distant derivation and more thorough assimilation of the mafic schlieren and clots in the syenite magma.

Although the concentric structure of the Wausau and Stettin syenite bodies suggests subvolcanic intrusion, numerous questions arise concerning emplacement mechanism. Xenoliths of highly disparate lithology, and metamorphic grade occur side by side in these plutons. Their lenticular shape suggests mechanical segmentation before or during syenite intrusion. Convoluted flow lineation in amphibole syenite (as at the Old Technical Institute in Wausau) indicates viscous flow, probably due to water-deficiency of the magma. At many locations it is very difficult to distinguish the intrusive phase: indeed, one is hard-pressed to find an uncontaminated syenite exhibiting the features of a true intrusive rock. Sillimanite-bearing quartzite occurs as a tabular xenolith in fine-grained hornblende syenite 2.5 km west-northwest of here. The sillimanite suggests considerable upward transport of the xenolith from a high-grade metamorphic basement. The mica schist and metagabbro(?) xenoliths at Mosinee Hill and along the east side of the Wausau syenite body also suggest a deep-seated source. The close-spaced juxtaposition of xenoliths of disparate lithology indicates considerable vertical movement of wallrock fragments. To what degree did collapse modify these intrusive relationships? Does the quartz syenite represent a syenite magma which was contaminated by xenolithic quartzite? To what degree was the syenite able to assimilate xenoliths? Textural relations seen throughout the pluton suggest little assimilation but considerable dilation owing at least in part to explosive eruption.

REFERENCES:

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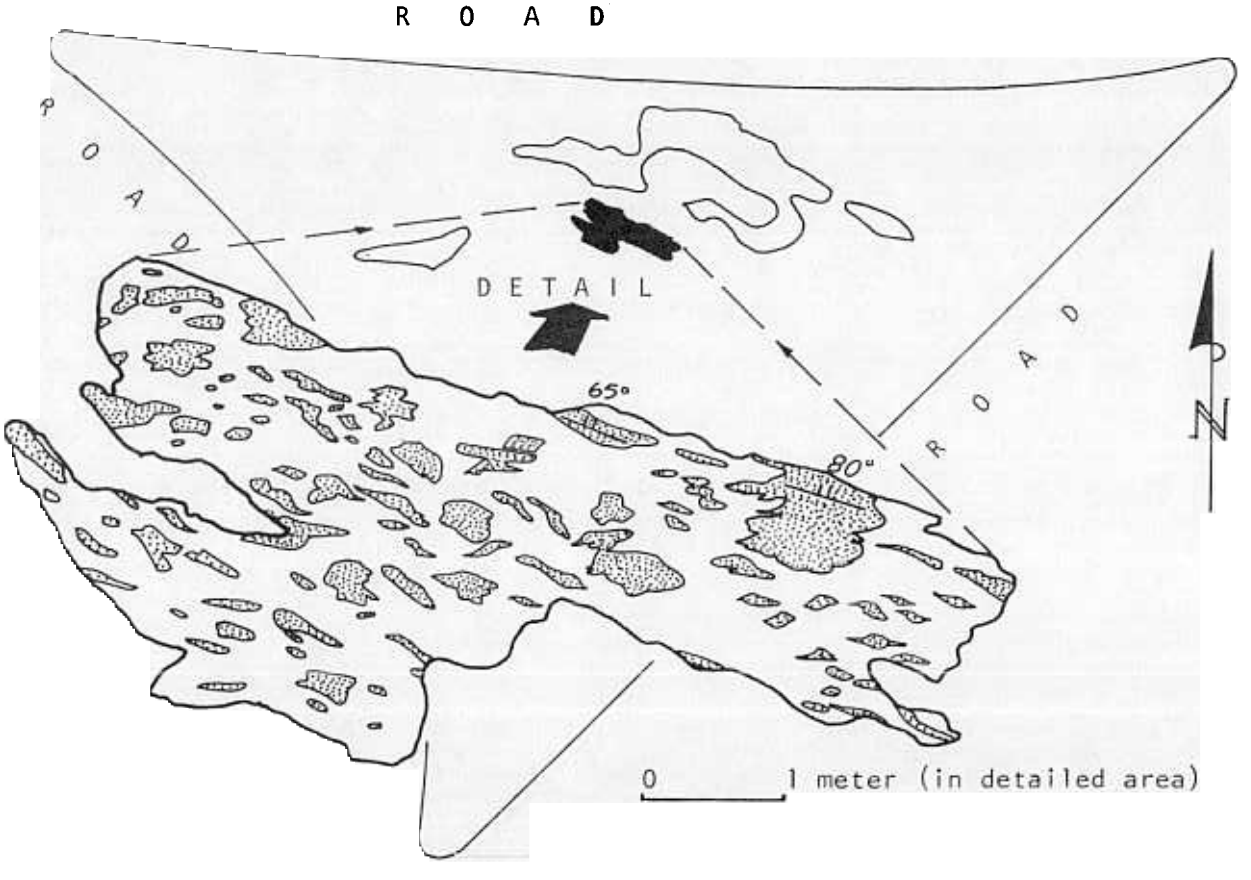

Figure 2 -- Volcanic xenoliths (dotted) in flow-lineated amphibole quartz syenite (white). Outcrops in grassed area between three roads behind Employers' Mutual Insurance Company.