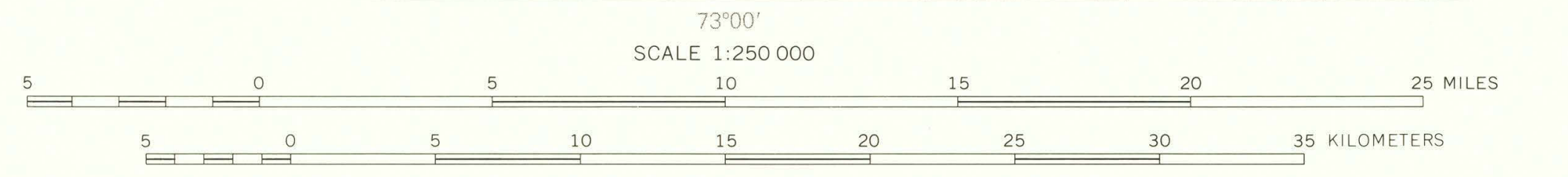
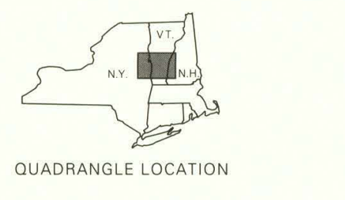
U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

MISCELLANEOUS INVESTIGATIONS SERIES
MAP I–2503

Base from U.S. Geological Survey 1972





QUADRANGLE LOCATION

INTERIOR—GEOLOGICAL SURVEY, RESTON, VA—1995

Manuscript approved for publication September 1, 1994

EXPLANATION

Volcanogenic massive sulfide deposits—Copper + zinc (± lead ± silver ± gold)

■ High
■ Moderate

Sediment-hosted deposits—Lead + zinc (± silver ± barite ± copper)

■ High
■ Moderate

Volcanogenic, magmatic-hydrothermal, and epithermal deposits—Gold (± silver)

■ High
■ Moderate

Vein and porphyry-related deposits—Tin ± tungsten ± molybdenum (± fluorspar)

■ High
■ Moderate

Stratabound, pegmatitic, and vein deposits—Uranium (± thorium) and rare earth elements

■ High
■ Moderate

Ultramafic-hosted deposits—Chromite (± platinum group elements)

■ High
■ Moderate

Orthomagmatic deposits—Titanium

■ High
■ Moderate

DESCRIPTION OF GEOLOGIC UNITS

(See Thompson and others, 1990, for unlabeled units)

Kp	Syenite, granite, diorite, and gabbro. Includes minor lavas and pyroclastic rocks (White Mountain Plutonic-Volcanic Suite)
Dg	Two-mica granite, granodiorite, and related rocks
Db	Granodiorite gneiss and related rocks (Bethlehem Gneiss and Spaulding Quartz Diorite)
Dk	Megacrystic quartz monzonite and related rocks (Kinsman Quartz Monzonite
Dl	Metapelites and metaturbidites (Littleton Formation)
Ss < Sv	Metapelites, calc-pelites, and metaturbidites of the Connecticut Valley-Gaspé sequence. Sv, metavolcanic rocks, mainly mafic
Sc	Quartzites, conglomerates, calc-silicate rocks and metapelites of the Bronson Hill sequence
Os	Pelites and calc-pelites of the continental shelf and platform
Ov	Metavolcanic rocks (mixed felsic and mafic)
Oo	Granite and related gneisses; may include some metavolcanic rocks (Oliverian and Highlandcroft Plutonic Suites)
Or	Allochthonous clastic sedimentary and metasedimentary rocks of the Taconic sequence (Poultney and Normanskill Formations and related rocks)
Og	Clastic metasedimentary rocks (Moretown Formation)
O€c	Carbonates and associated clastic sedimentary rocks of the continental shelf
O€t	Allochthonous clastic sedimentary and metasedimentary rocks of the Taconic sequence
O€g < O€v	Clastic metasedimentary rocks of the eastern Green Mountain region of the Chester and Athens domes. O€v, metavolcanic rocks, mainly mafic
Um	Ultramafic rocks, peridotite, dunite, and serpentinite
Ᵽs	Metasedimentary rocks of the Adirondacks, Green Mountains, and the Chester and Athens domes
Ᵽa	Anorthosite, metanorthosite, and related rocks
Ᵽd	Metagabbro and metadiorite
Ᵽg	Felsic gneiss (includes both intrusive and extrusive rocks)

EXPLANATION OF MAP SYMBOLS

┈	**Stratigraphic and intrusive contact**
▲	**Thrust fault**—Sawteeth on upper side
┴	**Normal fault**—Ticks on downthrown side
─	**Fault**—Movement not specified

INTRODUCTION

The Glens Falls 1° × 2° quadrangle, covering eastern New York, central Vermont, and western New Hampshire, has a long history of both metallic and nonmetallic mineral production (see Slack and Schruben, 1990). The assessment of mineral potential for the Glens Falls quadrangle presented here, however, is focused exclusively on metallic resources; non-metallic resources (for example, talc, graphite, dimension stone, slate) are not discussed.

METHODS OF MINERAL-RESOURCE ASSESSMENT

In assessing the mineral resources of the Glens Falls quadrangle, qualitative, rather than quantitative, methods have been employed. Because of a lack of detailed grade and tonnage data for a variety of metal commodities and deposit types in the quadrangle, qualitative recognition criteria are used here to establish degrees of resource potential (see Slack, 1990). High resource potential is assigned on the basis of a mineral occurrence (especially the locations of mines and prospects) and favorable geology, and is shown as extending generally 1–3 kilometers from known mines and prospects. Moderate potential is indicated for areas that have a geochemical anomaly together with either favorable geology or a mineral occurrence. Areas designated as having a low potential for different deposit types, not shown on this map, can be found in Slack (1990).

In this report, the author designates areas of mineral potential in the Glens Falls quadrangle largely on the basis of appropriate ore deposit models (for example, Cox and Singer, 1986; Roberts and Sheahan, 1988; Kirkham and others, 1993). These deposit models are used together with regional geology (Thompson, 1990; Thompson and others, 1990), the geochemistry of heavy-mineral concentrates (Day and others, 1986; Watts, 1990), the locations of mines, prospects, and mineral occurrences (Slack and Schruben, 1990), and selected geophysical data (Daniels, 1990; D.L. Daniels, USGS, oral commun., 1990) in the evaluation of mineral resource potential. For simplicity and because of their limited economic importance, mineral resources of iron and manganese (see Slack, 1990) are not shown on this map; resources associated with presumably small base-metal veins and other minor deposit types similarly are not illustrated. The different types of mineral deposits and metals considered here are (1) volcanogenic massive sulfide deposits of copper + zinc (± lead ± silver ± gold), (2) sediment-hosted deposits of lead + zinc (± silver ± barite ± copper), (3) volcanogenic, magmatic-hydrothermal, and epithermal deposits of gold (± silver), (4) vein and porphyry-related deposits of tin ± tungsten ± molybdenum (± fluorspar), (5) stratabound, pegmatitic, and vein deposits of uranium (± thorium) and rare earth elements, (6) ultramafic-hosted deposits of chromite (± platinum-group elements), and (7) orthomagmatic deposits of titanium. Areas of assigned mineral resource potential on the map are keyed to locality numbers listed in table 1. The following text is taken largely from Slack (1990), to which the interested reader is referred for additional details.

VOLCANOGENIC MASSIVE SULFIDE DEPOSITS OF COPPER + ZINC (± LEAD ± SILVER ± GOLD)

Shown on the map are areas designated as having moderate and high potential for volcanogenic massive sulfide deposits. These types of deposits, which may be hosted in either metasedimentary or metavolcanic rocks, commonly contain resources of copper and zinc, with or without associated lead, silver, and gold (for example, Franklin and others, 1981; Lydon, 1984). In western New Hampshire and easternmost Vermont, small deposits of this type are known in the Ordovician Ammonoosuc Volcanics and equivalent units, such as at the Blood Mountain (Waterman) mine, the Neal mine, and the Croydon mine (nos. A–1 to A–3). Although different in some respects, these deposits are all predominantly volcanic hosted and contain copper as the major metallic commodity; they may be broadly classified as Kuroko-type, after the well-known deposits of Japan (Ohmoto and Skinner, 1983). Areas in the Ammonoosuc volcanic belt that have significant geochemical anomalies in heavy-mineral concentrates (Day and others, 1986; Watts, 1990) are designated as having moderate resource potential (no. A–4). A similar rationale is used for geochemically anomalous areas within the Barnard Volcanic Member of the Missisquoi Formation (as used by Doll and others, 1961) in eastern Vermont (no. A–5).

Several other belts in eastern Vermont are shown as having moderate and high potential for the occurrence of Besshi-type massive sulfide deposits (for example, Slack, 1993). These deposits are dominantly sediment-hosted and contain mainly copper and zinc (± silver ± gold ± cobalt). The easternmost and largest of the favorable belts is comprised of portions of the Silurian to Lower Devonian Waits River and Gile Mountain Formations and the Standing Pond Volcanics[1], and hosts the stratabound massive sulfide deposits of the Orange County copper district (White and Eric, 1944; Slack and others, 1993), including those at the Ely, Orange and Gove, and Elizabeth mines. In addition to the mineral deposits, this belt contains significant geochemical anomalies in heavy-mineral (panned) concentrates (Watts, 1990; Slack and others, 1990) that together constitute areas of high resource potential (nos. A–6 to A–8); areas within this belt that have panned concentrate anomalies but no known mineral occurrences are assigned moderate potential for Besshi-type massive sulfide deposits (no. A–9). To the west, in the north-central part of the quadrangle, the Lower Ordovician clastic metasedimentary and minor mafic metavolcanic rocks of the Stowe Formation contain geochemical anomalies (Day and others, 1986; Watts, 1990) and are assigned a moderate potential for Besshi-type deposits (no. A–10); a high potential for similar deposits is shown surrounding the small Spathic iron mine (no. A–11) and a moderate potential is assigned to geochemically anomalous areas within the host Pinney Hollow Formation and to parts of the nearby Hazens Notch Formation (no. A–12).

SEDIMENT-HOSTED DEPOSITS OF LEAD + ZINC (± SILVER ± BARITE ± COPPER)

Sediment-hosted deposits of lead and zinc (with or without associated silver, barite, and copper) in the quadrangle are considered to be dominantly stratabound and stratiform, and belong to the so-called sedex (sedimentary-exhalative) class of base-metal sulfide deposits (for example, Goodfellow and others, 1993). A documented example of this deposit type occurs in the Lower Cambrian Monkton Quartzite at Lion Hill, Vermont (no. B–1), where stratabound sphalerite and galena are associated locally with layered iron formation like several of the sediment-hosted lead-zinc deposits of Ireland (Clark, 1990). Other lead-zinc prospects or occurrences in the lower Paleozoic shelf sequence of western Vermont and eastern New York (nos. B–2 to B–4) are also assigned a high potential for this deposit type. The entire belt of the Monkton Quartzite and underlying Dunham Dolomite (Lower Cambrian) are designated as having a moderate potential for sedex-type lead-zinc deposits (no. B–5), in spite of the lack of geochemical sampling (extensive glacial overburden prevented adequate geochemical coverage of these units; see Watts, 1990). Other areas of the early Paleozoic shelf sequence not underlain by the Monkton Quartzite or Dunham Dolomite that contain geochemical anomalies are assigned moderate potential (no. B–6). These latter areas may contain either (or both) sedex-type lead-zinc deposits or Mississippi Valley-type lead-zinc deposits (see Sangster, 1990).

A potential for sediment-hosted lead-zinc deposits is also assigned to early Paleozoic rocks of the Taconic allochthon in western New York and eastern Vermont. The geologic setting of the Taconic allochthon is very similar to that of other parts of the world that contain major sedex deposits, such as the Selwyn basin in the Canadian Cordillera (Carne and Cathro, 1982; Abbott and others, 1986). A small stratabound lead-zinc deposit in the Mudd Pond Quartzite Member of the Nassau Formation (see Potter, 1972) near White Creek, N.Y., just 2 km south of the southern border of the Glens Falls quadrangle, is considered to be of sedex type (Slack, 1990). Evidence in support of a sedex-type model for the Taconics comes from the discovery within the Browns Pond Formation (Rowley and others, 1979) of rare pyritic massive sulfide clasts that contain as much as 2.5 percent zinc (Watts, 1990). Based on this occurrence and on the favorable geologic setting, a moderate potential is assigned to the stratigraphically lower units within the Taconic allochthon (no. B–7), excluding the area of the Dorset Mountain structural slice that lacks significant base-metal (and barium) anomalies in heavy-mineral concentrates (see Watts, 1990).

In the eastern Adirondack Mountains several areas within a sequence of highly deformed and metamorphosed carbonate and calc-silicate rocks are designated as having a moderate potential for stratiform lead-zinc deposits (no. B–8). These areas have anomalous concentrations of lead in associated heavy-mineral concentrates (Day and others, 1986; Watts, 1990), and are considered favorable for the occurrence of Balmat-type sulfide deposits (for example, deLorraine and Dill, 1982; Whelan and others, 1984).

VOLCANOGENIC, MAGMATIC-HYDROTHERMAL, AND EPITHERMAL DEPOSITS OF GOLD (± SILVER)

Potential gold resources in early Paleozoic metavolcanic belts occur in eastern Vermont and western New Hampshire, and are suggested to be volcanogenic in origin. Such deposits are believed to be stratabound and in some cases stratiform, and related to dominantly submarine volcanic and subvolcanic processes; the possible range of deposit types may include exhalative gold deposits as well as classic epithermal deposits that formed in or near volcanic centers or hypabyssal intrusions. High potential is assigned to areas that contain anomalous gold in rock samples, such as near Bethel, Vt. (no. C–1) and Bellows Falls, Vt. (no. C–2). Areas within these volcanic belts that have high contents of gold and(or) arsenic in heavy-mineral concentrates (Day and others, 1986; Watts, 1990) are designated as having moderate potential for volcanogenic gold (nos. C–3 to C–6).

On the eastern side of the Green Mountains is a region that contains many gold-bearing quartz veins (Hager, 1861; Perkins, 1904; Perry, 1929[?]; Smith, 1976). The most significant of these veins and their surrounding country rocks (Pinney Hollow, Ottauquechee, and Missisquoi Formations) are shown as having high resource potential for metamorphogenic gold-quartz vein deposits (nos. C–7 to C–10). A moderate resource potential for gold of this type is assigned to areas in the same region (no. C–11) that contain anomalous amounts of gold in stream sediments and heavy-mineral concentrates (Day and others, 1986; Watts, 1990). A moderate potential for gold is also assigned to an altered ultramafic body (talc schist) from the core of the Chester dome, Vt. (no. C–12), that has anomalous concentrations of barium and copper like the gold-bearing listwaenites studied by Buisson and LeBlanc (1986).

A potential for magmatic-hydrothermal gold deposits is designated for the area of the Cuttingsville stock, Vt. Robinson (1990) identified a gold-bearing pyrrhotite replacement deposit in Proterozoic (Grenvillian) marble adjacent to this Cretaceous alkaline intrusive complex, and gold-bearing quartz-pyrite stockworks within altered pulaskite syenite on the eastern side of the complex. Based on the gold occurrences and favorable geology and geophysics (Robinson, 1990; Long, 1990), these areas are assigned a high potential for magmatic-hydrothermal gold (no. C–13). The buried northern extension of this intrusive complex (no. C–14), inferred from geophysical data (Daniels, 1990), is designated as having a moderate potential for gold deposits of this type.

Augen gneisses and adjacent rocks of Proterozoic age within the Green Mountain massif may also have a potential for gold. This assessment is based on recent studies of the White Bay area of Newfoundland, where concentrations of gold have been found in association with sheared and altered megacrystic granitic rocks of Late Proterozoic age along the eastern edge of the Long Range inlier (Tuach and French, 1986; Tuach, 1987). The similar geologic setting of the Green Mountain massif, together with geochemical anomalies for arsenic, molybdenum, lead, and zinc in parts of the massif (Slack, 1990) indicate a moderate potential for porphyry-related (?) gold (no. C–15).

A newly recognized potential for gold also exists in the Taconic allochthon of eastern New York and western Vermont. One gold occurrence is known in the area, at the Mount Colfax prospect north of Cambridge, N.Y. (Dale, 1899, p. 186), where a gold-bearing quartz-pyrite stockwork is localized within black slate. Such an occurrence probably is tectonically controlled and related to thrust faults formed during emplacement of the Taconic allochthon in Middle Ordovician time and(or) to later Mesozoic extensional faulting. The bedrock occurrence is designated as having high resource potential for gold (no. C–16). Areas defined by drainage basins that contain panned concentrates with anomalous gold and(or) arsenic are assigned moderate potential for gold (no. C–17). Some of these geochemically anomalous areas within the Taconic allochthon may also have potential for disseminated, Carlin-type gold deposits (see Slack, 1990).

VEIN AND PORPHYRY-RELATED DEPOSITS OF TIN ± TUNGSTEN ± MOLYBDENUM (± FLUORSPAR)

Data from mineral occurrences (Slack and Schruben, 1990) and regional geochemistry (Day and others, 1986; Watts, 1990) suggest that tungsten, molybdenum, and fluorspar are spatially associated with extensional Mesozoic faults, both in the eastern Adirondack Mountains and in western New Hampshire. Mineralization in such faults is known in the Westmoreland area, N.H., just south of the Glens Falls quadrangle, where large veins locally contain fluorite, barite, and base-metal sulfides (Bannerman, 1941). Areas surrounding the faults that have associated geochemical anomalies (no. D–1) are assigned moderate potential for vein-related tungsten, molybdenum, and(or) fluorspar.

Along the western edge of the quadrangle, Watts (1990) identified anomalous amounts of tin in heavy-mineral concentrates. The tin-bearing samples come from an area underlain by Proterozoic (Grenvillian) granitic gneiss, as mapped by McLelland (1990). Unlike the concentrate anomalies for tungsten, those for tin are not spatially associated with mapped faults. The tin-bearing samples may be derived from granite-related tin deposits, which are judged to have a moderate potential in the area of the panned concentrate anomalies (no. D–2).

In western New Hampshire, diverse geochemical anomalies and mineral occurrences appear to be related to Ordovician, Devonian, and Late Devonian or Carboniferous granitoid plutons. The oldest of these are the Ordovician Oliverian domes, which have associated scheelite- and molybdenite-bearing veins developed along the northern edge of the Mascoma dome and molybdenite-bearing veins along the southern and western contacts of the Lebanon dome; these areas are assigned high potential for vein-type deposits containing tungsten and molybdenum (nos. D–3 and D–4, respectively). Major tin and tungsten anomalies in panned concentrates within and surrounding the Smarts Mountain, Mascoma, and Unity domes (Watts, 1990) suggest a moderate resource potential for these metals (no. D–5). Geochemical anomalies associated with the syn- or late-kinematic Bethlehem Gneiss (Devonian) are believed to reflect the presence of similar tin and tungsten in porphyry-related veins, and are designated as having a moderate resource potential (no. D–6). Nearby tin and molybdenum anomalies in panned concentrates (Day and others, 1986; Watts, 1990) are considered to have come from molybdenite and cassiterite in granitic pegmatites within and peripheral to the Bethlehem Gneiss (no. D–7).

At the northern edge of the quadrangle is the southern portion of a small postkinematic Devonian granite that has major associated tin and tungsten anomalies in panned concentrates (Watts, 1990). This relationship suggests the possibility of tin and tungsten in greisen- or skarn-type mineralization, for which a moderate resource potential is assigned (no. D–8). The postkinematic, two-mica Sunapee granite (informal name) of Late Devonian age also has significant associated tin and tungsten geochemical anomalies (Day and others, 1986; Watts, 1990) and is judged to have a moderate potential for granite-related deposits of these metals (no. D–9). This latter region surrounding the Sunapee granite includes designated areas of moderate potential even though they are as much as 12 kilometers from the granite, based on the interpretation that apophyses of the Sunapee granite might exist at shallow depths in the area of the geochemical anomalies of this region.

The youngest igneous intrusions in the Glens Falls quadrangle, the Mesozoic alkaline bodies of the White Mountain Plutonic-Volcanic Suite, locally have associated molybdenum mineralization. Molybdenite is known at a small prospect on the western side of the Cuttingsville stock, and also in the small felsic intrusive body on Pollard Hill in New Hampshire. Areas surrounding these occurrences are shown as having high resource potential for granite-related molybdenum deposits (nos. D–10 and D–11, respectively).

STRATABOUND, PEGMATITIC, AND VEIN DEPOSITS OF URANIUM (± THORIUM) AND RARE EARTH ELEMENTS

Several major uranium deposits occur in Grenvillian gneiss of the Mount Holly Complex in the Green Mountain massif (Ayuso and Ratté, 1990). These deposits consist of uraninite in stratabound veins and segregations, locally associated with tourmaline concentrations. Areas surrounding the uranium deposits (for example, Ludlow Mountain prospect, west Jamaica prospects) are assigned a high resource potential for epigenetic vein-type uranium (nos. E–1 to E–3). Other parts of the Mount Holly Complex that contain anomalous radioactivity and uranium (Grauch and Zarinski, 1976; McHone and Wagener, 1982), including a uranium-rich pegmatite dike near Weston, Vt., are designated as having moderate potential for uranium (nos. E–4 and E–5, respectively).

In western New Hampshire, several types of uranium concentrations have been recognized. The most significant consists of secondary uranium minerals (alunite, renardite, torbernite) along fractures and joints in the Sunapee granite (Bothner, 1978; McHone and Wagener, 1982). An area surrounding a 5-meter-thick zone along Interstate I-89 that contains abundant uranium is assigned a high potential for granite-related uranium deposits (no. E–6); a smaller occurrence along Route 11 on the northern contact of the Sunapee granite is judged to have moderate potential for similar deposits (no. E–7). The youngest known uranium deposits in this area are in Holocene peat (Cameron and others, 1990) in the vicinity of the Sunapee pluton and near Brandon, Vt. (nos. E–8 and E–9, respectively), both of which are designated as having high potential for stratabound, surficial uranium deposits like those of the Flodelle Creek uranium mine in the State of Washington (Johnson and others, 1987).

In the eastern Adirondack Mountains, uranium is concentrated in granitic pegmatites within Grenvillian basement rocks (Tan, 1966; McHone and Wagener, 1982). Most of these occurrences are in small bodies that lack resource significance. However, four of the pegmatites are large (>2000 m^2) and have significant amounts of uranium, like those formerly mined in Grenvillian basement rocks in the Bancroft, Ontario, area (Robinson, 1960). These four pegmatites (nos. E–10 to E–13) are therefore judged to have high potential for granite-related uranium. The reconnaissance work of McHone and Wagener (1982) also suggests that these pegmatites have concentrations of rare earth elements, especially lanthanum.

Another occurrence of radioactive minerals in the quadrangle consists of anomalous thorium and possibly rare earth elements associated with stratabound, non-titaniferous magnetite deposits in the eastern Adirondack Mountains (L.C. Gundersen, USGS, oral commun., 1985). The similar Mineville-Port Henry magnetite deposits, just to the north of the Glens Falls quadrangle (Newland, 1908), contain significant quantities of rare earth elements (McKeown and Klemic, 1956; Beck, 1985). Reconnaissance radiometric surveys of the smaller, non-titaniferous magnetite deposits in the Glens Falls quadrangle by L.C. Gundersen (USGS, written commun., 1986) suggest that several of them may have similar concentrations of thorium and rare earth elements. The two magnetite deposits that showed the highest radioactivity are assigned moderate potential for these metals (nos. E–14 and E–15).

ULTRAMAFIC-HOSTED DEPOSITS OF CHROMITE (± PLATINUM GROUP ELEMENTS)

One occurrence of massive podiform-type chromite is known in a verde antique quarry near Rochester, Vt. (B.R. Lipin, USGS, oral commun., 1984; Ratté and Ogden, 1989). This deposit (no. F–1), and its surrounding belt of associated ultramafic bodies (F–2), are designated as having high and moderate resource potential, respectively, for podiform chromite deposits. Similar chromite deposits that occur in the Quebec Appalachians to the north (Kacira, 1982) locally contain significant concentrations of platinum group elements (Gauthier and others, 1990). Although analysis of one sample of massive chromite from the Rochester quarry failed to show anomalous amounts of any platinum group elements (B.R. Lipin, *in* Slack, 1990), a more thorough sampling program will be needed to rule out the potential for such metals in the Rochester chromite body. The apparent absence of podiform chromite deposits in the other ultramafic bodies of the Glens Falls quadrangle suggests that they lack a resource potential for platinum group elements.

ORTHOMAGMATIC DEPOSITS OF TITANIUM

In the Adirondack Mountains, one orthomagmatic titaniferous magnetite deposit is known within intrusive metagabbro at the small Moose Mountain mine, N.Y. Titaniferous magnetite ores at Moose Mountain are similar to those of the large Sanford Lake deposits in the Adirondack highlands, just to the northwest of the Glens Falls quadrangle (for example, Gross, 1968). The area of the Moose Mountain mine (no. G–1) and the surrounding host metagabbro (no. G–2) are assigned a high and moderate potential, respectively, for Sanford Lake-type titanium deposits.

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[1] In this report, the stratigraphic nomenclature of Hepburn and others (1984) is followed, which raised the rank of the Standing Pond Volcanic Member of the Waits River Formation (for example, Doll and others, 1961) to formational status as the Standing Pond Volcanics.

Table 1. Designated areas of moderate and high mineral-resource potential in the Glens Falls 1° × 2° quadrangle

Locality no.*	Area	Deposit type	Criteria†	Mineral potential
A–1	Blood Mountain copper mine, Vt. and N.H.	Kuroko-type massive sulfides	MO, FG	High.
A–2	Neal copper mine, N.H.	do.	do.	Do.
A–3	Croydon copper mine, N.H.	do.	do.	Do.
A–4	Ammonoosuc Volcanics, N.H. and Vt.	do.	GCA, FG	Moderate.
A–5	Barnard Volcanic Member of Missisquoi Formation,[1] Vt.	do.	do.	Do.
A–6	Ely copper mine, Vt.	Besshi-type massive sulfides	MO, FG, GCA	High.
A–7	Orange and Gove copper mines, Vt.	do.	do.	Do.
A–8	Elizabeth copper mine, Vt.	do.	do.	Do.
A–9	Gile Mountain and Waits River Formations, Vt.	do.	GCA, FG	Moderate.
A–10	Stowe Formation, Vt.	do.	do.	Do.
A–11	Spathic iron mine, Vt.	do.	MO, FG	High.
A–12	Pinney Hollow and Hazens Notch Formations, Vt.	do.	GCA, FG	Moderate.
B–1	Lion Hill lead-zinc mine, Vt.	Sedex-type lead-zinc	MO, FG	High.
B–2	Orwell lead-zinc prospect, Vt.	do.	do.	Do.
B–3	Danby lead-zinc prospect, Vt.	do.	do.	Do.
B–4	Unnamed lead-zinc occurrence, Saratoga Springs, N.Y.	do.	do.	Do.
B–5	Monkton Quartzite and Dunham Dolomite, Vt.	do.	GCA, FG	Moderate.
B–6	Early Paleozoic shelf sequence, Vt. and N.Y.	do.	do.	Do.
B–7	Taconic allochthon, N.Y. and Vt.	do.	do.	Do.
B–8	Eastern Adirondack Mountains, N.Y.	do.	do.	Do.
C–1	Gold occurrence near Bethel, Vt.	Volcanogenic gold	MO, FG	High.
C–2	Gold occurrence near Bellows Falls, Vt.	do.	do.	Do.
C–3	Ammonoosuc Volcanics, N.H. and Vt.	do.	GCA, FG	Moderate.
C–4	Gile Mountain Formation, Vt.	do.	do.	Do.
C–5	Barnard Volcanic Member of Missisquoi Formation,[1] Vt.	do.	do.	Do.
C–6	Stowe Formation, Vt.	do.	do.	Do.
C–7	Joe Manning gold mine, Vt.	Metamorphogenic vein gold	MO, FG	High.
C–8	Taggart and related gold mines, Vt.	do.	do.	Do.
C–9	Rooks gold mine, Vt.	do.	do.	Do.
C–10	Unnamed gold prospect, Vt.	do.	do.	Do.
C–11	Early Paleozoic eastern Vermont sequence, Vt.	do.	GCA, FG	Moderate.
C–12	Altered ultramafic body, Chester dome, Vt.	Ultramafic-related gold	do.	Do.
C–13	Cuttingsville intrusive complex, Vt.	Porphyry-related gold	MO, GCA, FG	High.
C–14	Northern extension of Cuttingsville stock, Vt.	do.	GPA, FG	Moderate.
C–15	Sulfidic zones in Proterozoic augen gneiss, Vt.	do.	GCA, FG	Do.
C–16	Mount Colfax gold prospect, N.Y.	Stockwork vein gold	MO, FG	High.
C–17	Taconic allochthon, N.Y. and Vt.	do.	GCA, FG	Moderate.
D–1	Extensional faults, N.Y. and N.H.	Fault-related veins	do.	Do.
D–2	Proterozoic granitic gneiss, Adirondack Mountains, N.Y.	Porphyry-related(?) veins	do.	Do.
D–3	Scheelite-bearing veins, Mascoma dome, N.H.	do.	MO, FG	High.
D–4	Molybdenite-bearing veins, Lebanon dome, N.H.	do.	do.	Do.
D–5	Oliverian domes, N.H.	do.	GCA, FG	Moderate.
D–6	Bethlehem Gneiss, N.H.	do.	do.	Do.
D–7	Molybdenite- and cassiterite-bearing pegmatites, N.H.	Granitoid concentration	MO, GCA	Do.
D–8	Acadian(?) pluton, Vt.	Porphyry-related deposits	GCA, GPA, FG	Do.
D–9	Sunapee pluton, N.H.	do.	GCA, FG	Do.
D–10	Cuttingsville intrusive complex, Vt.	do.	MO, FG	High.
D–11	Pollard Hill intrusions, N.H.	do.	do.	Do.
E–1	Ludlow Mountain (Grant Brook) uranium prospects, Vt.	Epigenetic vein uranium	MO, FG	High.
E–2	East Jamaica uranium prospects, Vt.	do.	do.	Do.
E–3	West Jamaica (Pinnacle and College Hill) uranium prospects, Vt.	do.	do.	Do.
E–4	Stratabound uranium, Green Mountains, Vt.	do.	do.	Moderate.
E–5	Uranium-rich pegmatite dike, Weston, Vt.	Granite-related uranium	GCA, FG	Do.
E–6	I–89 uranium occurrence, N.H.	do.	MO, FG	High.
E–7	Rte. 11 uranium occurrence, N.H.	do.	GCA, FG	Moderate.
E–8	Uraniferous peat, near Sunapee, N.H.	Surficial ground-water concentration	MO, FG	High.
E–9	Uraniferous peat, near Brandon, Vt.	do.	do.	Do.
E–10	Uraniferous pegmatite, Spar Bed Hill quarry, N.Y.	Granite-related uranium	do.	Do.
E–11	Uraniferous pegmatites, near Brant Lake, N.Y.	do.	do.	Do.
E–12	Uraniferous pegmatite, Fort Ann quarry, N.Y.	do.	do.	Do.
E–13	Uraniferous pegmatite, Overlook quarry, N.Y.	do.	do.	Do.
E–14	Radioactive iron deposits, N.Y.	Hydrothermal iron oxides	GCA, FG	Moderate.
E–15	do.	do.	do.	Do.
F–1	Rochester verde antique quarry, Vt.	Podiform chromite	MO, FG	High.
F–2	Rochester area, Vt.	do.	GCA, FG	Moderate.
G–1	Moose Mountain titanium mine, N.Y.	Orthomagmatic ilmenite	MO, FG	High.
G–2	Moose Mountain, N.Y.	do.	GCA, FG	Moderate.

*Locality designations refer to areas having moderate or high mineral resource potential (see map).

†Criteria abbreviations: MO = mineral occurrence; FG = favorable geology; GCA = geochemical anomaly; GPA = geophysical anomaly.

[1] As used by Doll and others (1961).

[2] Of Chapman (1968).

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MAP SHOWING METALLIC MINERAL RESOURCE POTENTIAL OF THE GLENS FALLS 1° × 2° QUADRANGLE, NEW YORK, VERMONT, AND NEW HAMPSHIRE

By

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