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MINNESOTA MINING & MANUFACTURING CO. COPLEY, OHIO

AC&Y's Most Interesting Shipper





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Front Cover and Page 13: Ed Kirstatter found MINX 1065, MINX 1019 and MINX 1027 at Copley, Ohio, in July 1960 depite stenciling which instructs empty cars be returned to Corona, California. Based on archive documents, 3M employed private cars to store finished roofing granules on site and at Belt Junction (the nearby A&BB interchange) rather than build expensive MINX 1065 (front cover) appears warehousing. identical to the 150 former Piedmont & Northern boxcars acquired by the AC&Y in 1939 as the 2000series. Also pictured is the 3M Oleum (sulphuric acid) operation at Copley about 1980. The author found raw sulphur shipped in Canadian Pacific marked gondolas. AC&YHS Archive and Author's collection.

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Editorial:

From Bob Lucas ...

The customers of the AC&Y were like a "who's who" of American industry. One of the most fascinating was the mining company that didn't. The Minnesota Mining and Manufacturing Co., better known as "3M", is both interesting and relevant to the history of the AC&Y.

The firm began in northern Minnesota in 1902 to exploit a deposit of corundum abrasive. After some effort, the deposit was deemed worthless. Though discouraged, the founders kept the firm alive. With vision and hard work, 3M ultimately became a crown jewel in the American free enterprise system. Today, 3M is a multinational conglomerate with 88,000 worldwide employees. The firm produces some 55,000 products including Scotch brand tapes, adhesives, laminates, car care products, electronic circuits and optical films.

In 1983, 3M elected to exit the acid business and sold their Copley operations to PVS Chemical Solutions. Years before, the roofing granule colorization plant was closed and dismantled. Several visits to the Copley facility made decades apart yielded a treasure trove of information dating to the time it was operated by 3M.

The story presented herein combines both industrial archeology and railroad history with emphasis on modeling potential. We are grateful to PVS Chemical Solutions for sharing the heritage of the Copley plant. Additional information was gleaned from online sources, <u>Brand of the Tartan – the 3M Story</u> by Virginia Huck and the <u>Sesquicentennial History</u> (1819-1969) of <u>Copley Township</u> by the Kiwanis Club of Copley.

Society Archive:

So, what's the big deal about the AC&Y? That question has been posed more than once. The AC&Y was unique among Class I railroads over its seventy year existence – a resourceful, well-managed transportation enterprise with both charm and character. The AC&Y contended successfully on a playing field vs. much larger rivals. What has been saved in terms of historical records compares to any "Fallen Flag" railroad in the Nation.

Your AC&Y HS Archive collection of photos, financial records, documents, maps, drawings and track diagrams is both impressive and invaluable. As most are aware, the Society currently has a secure facility in Akron to house these remarkable records plus our other assets. However, given the migration of the Society to an open membership (no dues) structure and fixed costs for our leased space, we are exploring placement options with several professional archive repositories. We underscore the importance of archival preservation and assure all that decisions regarding our historical materials will be for the benefit of present and future generations.

Minnesota Mining – Copley

AC&Y's Most Interesting Shipper

By Bob Lucas



Above: An undated birds-eye view of the fascinating Minnesota Mining and Manufacturing (3M) complex at Copley, Ohio shows the roofing granule plant, the iron oxide, chromium oxide and sulfuric acid operations. 3M's narrow gauge railroad ran to a quarry on the other side of Copley Road. Note the stockpiles of raw sulfur and iron ore. Courtesy Copley Kiwanis Club. Author's collection.

viators winging over the mid-1930's American landscape observed a great change taking place below them. The alteration was in America's housetops. In fact, an entire advancement was in progress. Homeowners were switching from drab wood, slate and tile shingles to brightly colored roofs made with a new kind of protective material – asphalt shingles coated with artificially colored granules. Eye-catching red, green, blue and buff roofs were replacing the nondescript gray, brown and black housetops which had ruled for generations. The Minnesota Mining and Manufacturing Co., better known as 3M, contributed substantially to this evolution. The new types of asphalt roofing with artificially colored roofing granules were created in 1930 by the 3M research laboratory. That year, 3M unexpectedly entered the roofing business because they "bought a mountain". The prior year, 3M's only competitor, Wausau Abrasives was for sale. 3M purchased the firm and inherited a sandpaper manufacturing plant, a mineral crushing plant and a mountain containing an unlimited supply of silica quartz called "Rib Hill".



3M initially sought other applications for its "quartz mountain". A few unsuccessful ideas came first. Then a 3M employee learned that a local St. Paul, Minnesota asphalt

roofing manufacturer was looking for a colored material (mineral) that would not fade in the sun or deteriorate under other weather conditions. This led to a 3M product labeled "Colorquartz", silica quartz coated with red, green, blue or buff ceramic glaze. Despite the depression, 3M soon discovered there was an unfilled demand for "Colorquartz" even though it was twice the cost of natural gray slate. Sales grew from \$26,413 in 1932 to \$255,379 in 1933 and \$657,402 in 1934. Green proved to be the most popular color.

However, with an unproven colorizing process, 3M could not assure or guarantee customers that "Colorquartz" would not fade over time. There was great risk in adding new plant capacity or expanding the roofing granule manufacturing facilities in Wausau.

It was then discovered that 3M's gravest fear for its investment in quartzite granules had come true. The 3M "Colorquartz" began mysteriously popping off the underlying asphalt shingles leaving blotchy black deteriorated roofs. It was learned that sunlight was penetrating the Rib Hill quartz causing the asphalt to oxidize. This destroyed the adhesive qualities allowing the granules to pop off. 3M was fortunate. The problem was caught early and the company had a supply of another similar opaque rock which could be used as the substitute base.

About the time "Colorquartz" complaints arose, trouble cropped up from another direction. A Copley, Ohio firm named R. J. Funkhouser began infringing on patents covering 3M Repeated warnings sent to cease granules. production were to no avail. Primarily a manufacturer of slate roofs, Funkhouser was also making a ceramic granule using a silica sand base supplied under contract by a firm named Columbia Silica Company. 3M preferred not to litigate, but as Funkhouser continued to infringe, it appeared there was no alternative. Relations became very strained between all parties concerned.



Above: Another undated aerial view looking south shows the original 3M colorization plant before other operations joined the complex. Courtesy PVC Chemicals, Author's collection.

Moreover, the dispute involved other roofing manufacturers who had interests in related patents and license agreements. Color roofing had become a lucrative market. However, when faced with a lawsuit, Funkhouser agreed to sell its Copley plant to 3M who also acquired Columbia Silica. These two acquisitions gave 3M an additional 50,000-ton annual capacity nearer Eastern markets until 1947, when the Copley quartz deposit ran out. (Authors note: There are reports that silica sand was procured from a quarry at Phalanx, Ohio served by the Erie, supported by undated photos showing loaded Erie RR gondolas at Copley.)

Between the Copley and Wausau plants, 3M could adequately serve all Midwestern and some Eastern roofing manufacturers. A new granule plant was opened in 1947 near Little Rock, Arkansas and yet another in 1951 at Corona to serve the California market.

While other firms were slashing payrolls, 3M was a depression phenomenon in the industrial world. By 1940, 3M had diversified into five businesses divisions: abrasives, tape, adhesives, roofing granules and miscellaneous products. "Colorquartz" remains a viable 3M trade name for ceramic crystals and is marketed in 14 colors and two grades for various applications.



Above: Yet another birds-eye view shows the quarry south of Copley Road and the 3M complex beyond. As it appears the granule plant is still in operation, this photo was likely taken before 1947. The plant office on Copley Road was the original Bramley farm house. Note the narrow gauge quarry railroad. The property is now the Copley Township Community Park. Author's collection.

One of the early industries coming to Copley soon after the turn of the century was the Columbia Silica Company which purchased forty acres of the Bramley farm on Copley Road. The firm sought to crush and grade pebbles found just under the farm's topsoil to manufacturer sand-blast and foundry sands for an established market. It is not known how or if Columbia Silica was affiliated with Columbia (Southern) Chemical of nearby Barberton. It is reported that Frank Bramley, owner of the farm received for about half his acreage more than ten times the original cost of the entire farm. The old Bramley family farm house was modified to serve as the local office. Frank and his two sons also were employed. For some time, Columbia Silica worked the land, making sand and shipping it by rail to various industries in the east. Later the Funkhouser Company, makers of roofing granules joined with the silica concern and established a plant on the remaining farm land north of Copley Road. The two firms worked together, one doing the crushing and the other making roofing granules. Then, on February 16, 1935, 3M acquired both companies and thus took over the entire Copley operation.



Above: This 1922 Summit County Plat map shows the Frank Bramley farm between Copley Road and the AC&Y. Also shown is the terminal trackage and wye which were established to support AC&Y's ill-fated commuter train service between Copley and Mogadore. The old Columbia Siica quarry was donated by 3M to Copley Township and is now a community park. Courtesy Barberton Public Library.

Little is known about either Funkhouser or Colmbia Silica at Copley before their respective take-overs by 3M in 1935. Snippets found in online searches indicate that blasting was utilized to dislodge quarry stone deposits. The Copley deposit was reportedly an outlier of the Sharon conglomerate. Also, it appears there was a large fire in 1929 which destroyed much of Columbia Silica's crushing machinery and electrical apparatus. Funkhouser was involved in several freight rate disputes with the AC&Y (and other railroads) covering roofing granules to their various roofing plants.

Based on track capacity investments, it is presumed the AC&Y-Northern Ohio handled considerable rail business to and from Copley before and after 1935. However, there are no traffic reports detailing colorized quartz silica. That commodity likely was considered "products of mines", aggregated with other stone and sand shipments.

Ralph Shiring provided a document by H.H. Copeland & Sons, a bondholder investment service, which provides a snapshot of Copley traffic in 1936. Received traffic totaled 7,888 tons (est. 200 carloads) and forwarded traffic was 99,154 tons (est. 2500 carloads). Based on AC&Y-N.O. percentage splits, the inbound (received) revenues mostly came from eastern U.S. origins whereas the outbound (forwarded) revenues (presumably granules) were roughly split east (AC&Y) and west (N.O.).

	AC&Y	N.O. Rwy.	Other RR's
Received:	19.66 %	9.23 %	71.11%
Forwarded:	19.87 %	17.14%	62.99 %





Above: Two interesting images were captured at the north end of the 3M colorization plant at Copley just before production was discontinued in 1947. Note the private steam crane which was used to feed quartz silica from storage locations into various color bins. Courtesy TLC Publishing.



Above: Yet another extraordinary view at Copley features AC&Y's new #D-2, an Alco-GE RS-1 diesel delivered late 1945. AC&Y bordered the north side of the 3M property. The gondola visible is former AC&Y 1106, one the first AC&Y freight cars built in 1912 by ACF Industries. 3M acquired it from AC&Y in September 1941 for plant use. AC&Y accident investigation photo, Society Archive.



Above: AC&Y's photograher (and auditor), Earnest Pequinot, found the 3m privately owned steam crane unloading a W&LE hopper at Copley. AC&Y accident investigation photo, Society Archive.



Above: This AC&Y accident investigation photo was taken adjacent the granule colorizing buildings on 3M property. Note the narrow gauge trams filled with unprocessed silica quartz. Society archive.

In the years between 1938 and 1943, three new products were added at Copley; production of iron oxide (FeO), chromium oxide (Cr_2O_3) and sulphuric acid (H_2SO_4). Chromium oxide is a green pigment used in the granule colorization

process and in paint, ink and glass. Iron oxide is a red-brown pigment. In 1954, a second acid plant was added. 3M ceased production of iron oxide at its Copley plant in 1966. Little more is known about these operations.

MINNESOTA MINING AND MANUFACTURING COMPANY, INCORPORATED.

GENERAL OFFICERS.

GENERAL OFFICES, 900 BUSH AVE., ST. PAUL 6, MINN.

FREIGHT EQUIPMENT-Reporting Marks-"MINX"

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Above: This October 1957 ORER lists the private equipment operated by 3M. Author's collection.

Another interesting facet of Minnesota Mining is that the company operated a roster of private specialized railcars with reporting marks "MINX". Based on photos and data from ORER's (Official Equipment Registers), these cars were all steel underframe wood boxcars modified for roofing granule transportation. The AAR mechical designation for the 3M cars was "LC" which was a boxcar with side doors and roof hatches. It appears many, if not all, cars were acquired second hand. The connection to the AC&Y's 2000-series ex-P&N boxcars is evident. The car featured on the front cover (MINX 1065) is clearly a former Piedmont & Northern Railway box built in 1925. 3M appartently secured the remaining eleven ex-P&N cars in 1940 after AC&Y's 150-car purchase. The number of cars on the 3M roster seemed to fluctuate with total of 71 cars in July 1942, 60 cars in 1940, 47 cars in 1951 and 31 cars in 1957. It is believed the cars served as onsite granule storage at the Copley plant and elsewhere. It was reported that AC&Y trainmen hated the 3M box cars as they were poorly maintained and often bad ordered.



Above: Bob Richardson found MINX 1011 and other 3M boxcars on A&BB's Fairlawn extension at Belt Junction (Copley) in 1938. A previous swamp fire closed the A&BB connection for nearly ten years. MINX equipment was stored on the remaining servicable trackage. Author's collection.



Above: AC&Y consolidation No. 323 switches MCAX 533, a Mather boxcar (not AC&Y) assigned to 3M at Copley. Courtesy TLC Publishing. Author's collection.



Above: AC&Y's system diamgram shows the track arrangements between Copley Jct. (Milepost 152.3) and Belt Jct. (MP 155.6), plus the private industry tracks on 3M property. Author's collection.



Above: AC&Y's management was embroiled in a bitter proxy fight with Cleveland interests in the forties, but earned 3M's endorsement along with that of many other shippers. Author's collection.



Above: In two undated view, the first in color shows the 3M complex after the colorization plant was closed and dismantled. The B&W image is the granule plant and quarry as it appeared before addition of the acid plant. Both Copley Road and the AC&Y appear. Author's collection.



Front Cover, Top and Below: Ed Kirstatter found MINX 1065, MINX 1019 and MINX 1027 at Copley, Ohio, in July 1960 depite stenciling which instructs empty cars be retured to Corona, California. Based on archive documents, 3M employed private cars to store finished roofing granules on site and at Belt Junction (the nearby A&BB interchange) rather than build expensive warehousing. MINX 1065 (see front cover) appears identical to the 150 former Piedmont & Northern boxcars acquired by the AC&Y in 1939 as the 2000-series. Eleven P&N cars were sold to others, perhaps some to 3M? Also, note the iron ore pile to the right of the MINX 1027. Courtesy Ed Kirstatter. Author's collection.







Above: Shown are views of the 1937 track arrangement at Copley and the private industry tracks into the Columbia Silica property as of 1927 before 3M purchased the plant. AC&YHS Archive.



Above: Shown is an undated view of the 3M acid plant at Copley plus private industry tracks with two tank cars. Note the raw sulphur In bins. Courtesy PVS Chemical Solutions, AC&YHS Archive.



Above: Shown is a plant arrangement for the silica colorization buildings at the 3M Copley plant, matching photos on previous story pages. Courtesy PVS Chemical Solutions, AC&YHS Archive.

File: 76153 Minnesota Mining & Mfg. Co.

Akron, Ohio, September 21st, 1942.

Mr. H. B. Stewart, Jr., Trustee, The AC&Y Railway Co., Akron, Ohio.

Dear Sir:

Under Subject #364 at Advisory Committee meeting on September 21st, Committee approved the construction of three tracks at Copley as follows:

10

SEP 22 1942

Track No. 1, just adjacent to the main line, is 2360 feet long; track No. 2, leading from No. 1 and south of, is 2130 feet long; and, track No. 3 is a crossover from the main line to the present track leading to the Minnesota Mining & Manufacturing Company plant and is 185 feet long.

Ever since we have been switching this location we have been handicapped on account of not sufficient track room and also on account of the distance between switches, it being 428 feet from the point of switch of the Minnesota Mining track to the switch on the east end of the Copley passing track which has been used as a storage and switch track. Under the proposed setup the switches at the east end will all be located together and the proposed layout will furnish the required tracks to expedite our switching at this location.

Due to the fact that the Fairlawn Extension of the A&BB is being rebuilt from Copley Road north and as soon as placed in service will necessitate providing that portion of these tracks now being used for storage tracks by the Minnesota Mining Company being vacated by them and storage provided at another location, track No. 2 is being constructed at an approximate gross cost of \$10,172 and it is proposed to lease to the Minnesota Mining & Manufacturing Company, this track and land on a yearly rental basis that is sufficient to provide for the Minnesota Mining repaying us the cost of the track in the 3-year period.

The total estimated cost of the three tracks is as follows:

Property Installed	\$23,892
Property Retired	190
Charge to Investment	23,702
Salvage	None
Operating Expenses	20
Estimated Gross Cost	23,912
Estimated Net Cost	23,912

If you approve, may I have an AFE to cover?

Yours very truly,

attins

Chief Operating Officer

HGW:G -cc - JRW, Chairman CGA FFL RJH JJK

Above: A letter summarizes construction of three tracks to facilitate switching at Copley and to accommodate 3M equipment held on tracks of the A&BB Fairlawn extension. AC&YHS Archive







Above: Shown is a plant arrangement for the chrome, iron oxide and oleum (acid) buildings at 3M Copley plus an undated view of the small oleum operation. Also shown is switching activity on the AC&Y north of the 3M plant. Courtesy PVS Chemical Solutions, AC&YHS Archive.





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