UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

REMEDIAL SITE ASSESSMENT DECISION - EPA REGION III

Site Name:	Blades Groundwater		
SEMS ID#:			
DSN:	DE-392		
Alias Site Names:	N/A		
City:	Blades		
County:	Sussex		
State:	Delaware		
Watershed Priority Area:			
Refer to Report Dated:	Multiple Reports – Preliminary Assessments; Site Inspections, PRP RI Reports, PFAS sample results from public wells		
Report Type:	Preliminary Assessment (PA)		
Report developed by:	State of Delaware Department of Natural Resources and EPA		
Site Decision Made by:	Connor O'Loughlin	**Date:**	03/13/2018

DECISION: H - Higher Priority for further assessment

1. **Further Remedial Site Assessment under CERCLA (Superfund) is not required because:**
   - N - NFRAP No Further Remedial Action Planned
   - A - Addressed as part of an existing NPL site (site will be entered if this is selected)
   - D - Deferred to RCRA
   - B - Addressed as part of another non-NPL site
   - W - Referred to Removal, no further Remedial Assessment
   - DN - Deferred to NRC
   - SA - Recommended as a SF Alternative Site
   - OCA - Other Cleanup Activity: Fed Fac (FF) Private Party Lead (PP) State Lead (OS)

2. **Further Assessment Needed Under CERCLA:**
   - H - Higher Priority for further assessment
   - L - Lower priority for further assessment
   - G - Recommended for HRS Scoring
   - F - Referred to Removal, Needs further Remedial Assessment

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DISCUSSION/RATIONALE:
The United States Environmental Protection Agency (EPA) in cooperation with Delaware's Department of Natural Resources and Environmental Control (DNREC) concur that further investigation and actions are required at the Procino and Peninsula Plating sites in Hockessin, DE ("the Site"). The Procino Plating Site (EPA ID No. DEN000306737) is in Blades, Delaware. The Peninsula Plating Site (EPA ID No. DE0001167998) is in Blades, Delaware.

Due to new information and sample data identified in a file review of the 2010 - Procino Plating Preliminary Assessment (PA) report in February 2016, EPA has suggested additional sampling activities of three municipal wells. From April 2016 to January 2018 due to the potential for perflourinated compounds (PFAS) emanating from the Procino Plating Site. DNREC collected three groundwater samples from the public wells in Blades, DE at EPA's suggestion to identify if electroplating process chemicals were comingled with PFAS electoplating compounds (Fumetrol 140).

Additionally, contamination was previously documented emanating from the Peninsula Plating facility. The facility was identified as being adjacent to three public wells operated by the town of Blades. The three-shallow public drinking water wells are impacted by PFOS/PFOA (PFAS) above the Health Advisory Level (HAL) which is a contaminant of concern. Two electroplating facilities are within 1,000 and less than 200 feet of the public wells and have the potential to be a source of PFAS and metals contamination in the public and residential wells.

Site History: Procino Plating Incorporated:
The Procino Plating building was first constructed in 1937 and a second building was added in 1954. The parcel is a 1.6 acre plating facility and has been active and operating as a plating facility since the 1980's. The extent of plating operations has been reduced to hard chrome plating for griddle tops and minor aluminum etching. Liquid chromium was stored in two large tanks inside the plant. Initially, the building had a wooden floor underlain by a crawl space on top of bare soil below the building. The wood floor was removed and a concrete slab was installed 1990. Another building was added in 1993 primarily to house silver and electroless nickel plating for commercial and military customers.

In 1996, Procino Plating installed a subsurface wastewater collection and treatment system to collect and treat the wash and rinse water and the floor drains at the plant. The business employed 60 people at its peak in 1997. Two smaller buildings were constructed between 1997 and 2002. Following business downturns, the plating process in the second building was dismantled in 2007, and the wastewater piping system and drains were sealed with concrete as part of the DNREC VCP remediation plan. The chrome tanks were drained and removed from service in 2009. The business currently employs 10 people and has a smaller operation.

Site History: Peninsula Plating Incorporated:
The other electroplating facility in the area is the Former Peninsula Plating site. The parcel consists of approximately 5.8 acres, and is located on the west side of the town. River Road borders the property to the south, Market Street to the east, the Conrail railroad to the west and the Town Hall and residential properties along 4th Street to the north. The site was in operation from the 1970's to 1995. There are six older warehouse/storage type buildings present on the property of various sizes and conditions. The property is zoned as a Manufacturing/Warehouse district. Historically in the 1980's to 1990's the buildings were leased out to a variety of companies including a metal plating company, a vending company, a sign company, a trash hauling firm, a steel products company, a bread company distribution center. The property is currently vacant except for one building being used for storage.

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In 1995 EPA conducted a removal action on the abandoned Peninsula Plating facility to remove hazardous materials, drums, and tanks. The EPA action noted the presence of various chemicals used in the plating process including nickel sulfate, sulfuric acid, chromic acid, nickel chloride, and copper cyanide. A Site Inspection (SI) was completed in 1999 to investigate the possible existence of released hazardous substances at the Peninsula Plating property through the collection and analysis of environmental samples. The media sampled included surface soils, deep soils, and groundwater.

The two electroplating sites are surrounded by residential properties to the north, south, and east. Railroad tracks are located adjacent to the sites to the west and just beyond the tracks is an additional residential community. The former metals plating facility (Prociono and Peninsula Plating) are located to the south of the Town of Blades three public water supply wells.

Procino Plating - Environmental History

DNREC was asked to investigate the site due to alleged improper handling of hazardous waste at the site. A Preliminary Assessment (PA) dated October 2010 was performed on the site. In consideration of the electroplating history, the sandy shallow soil, the shallow depth to groundwater, and the proximity of public water supply wells in the unconfined Columbia aquifer, recommended further site evaluation.

Due to the high potential of chemical releases, a Site Investigation (SI) was conducted in 2011 due to the potential to impact soil and groundwater. EPA noted that over 100 homes across the railroad tracks were on private wells. The SI was performed by DNREC in coordination with the Delaware Division of Public Health Office of Drinking Water (ODW) and included sampling any registered / permitted private water supply wells within the Town of Blades limits. Water samples from outdoor spigots of residential homes were taken at each registered, accessible private well. A total of 12 private water supply wells were sampled surrounding the site and in addition 13 borings and 6 monitoring wells were installed.

Results of the residential sampling during the SI indicated that dieldrin and heptachlor epoxide were detected at levels exceeding EPA's screening levels. Chromium was detected in one well approximately 10 times the EPA MCL. Nickel was detected but was below EPA screening levels. Both iron and manganese were detected but not considered a concern due to background levels and lack of health effects.

DNREC evaluated the horizontal and vertical extent of chromium and pesticides detected in monitoring wells. Only shallow ground water was evaluated during the SI. A detection of cyanide in an offsite drinking water well was identified between 43 and 48 feet below ground surface, coupled with the fact that cyanide containing solutions are commonly used in plating operations and a polyethylene tank was noted on the property with the words "Cyanide Treatment 2" stenciled on the side, raise concern of a release from the Site. The presence of any Site related compound at a depth greater than approximately 20 feet below ground surface was not evaluated as part of the SI. Therefore in 2011, DNREC recommended further evaluation of groundwater below a depth of 20 feet. It is also recommended that additional private water supply wells be tested and analyzed for the presence of total metals and cyanide.

DNREC's 2011 Site Inspection identified total chromium in groundwater at a concentration above EPA's Maximum Contaminant Level (MCL) of 100 micrograms per liter (µg/L, parts per billion) in one of six onsite monitoring wells. None of 16 potable water samples from nearby home wells contained chromium at a concentration near or above the MCL. None of 26 soil samples contained chromium at a concentration were above DNREC's 214 mg/kg soil screening level. Although analyzed, cyanide was not detected in onsite SI samples (6 groundwater and 26 soil), it was detected in a nearby home well sample at

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a level (20 μg/L) below cyanide's 200 μg/L MCL. Procino Enterprises joined DNREC's Voluntary Cleanup Program in order to further evaluate environmental site conditions by performing a RI.
From 2011 to 2016, DNREC oversaw further assessment through the Delaware's Voluntary Cleanup Program. As such a Remedial Investigation was ongoing by the owner of the facility and therefore EPA assigned a high qualifier to this site along with a status of Other Cleanup Activity (OCA).

Soil chromium levels in 2012 samples collected from below the concrete slab near the former chrome tank locations were below DNREC's chromium soil Screening Level of 214 mg/kg, thus not indicative of a residual sub-slab soil source. Six May 2012 groundwater samples were analyzed for metals and cyanide; one sample (MW-6) contained chromium at a concentration above the 100 μg/L MCL. Downgradient chromium levels ranged from not detected (<1.1 μg/L) to 25 μg/L.
In May 2013, five new RI wells and two onsite deeper double-cased were installed and sampled for chromium and cyanide. Two of the ten samples (MW-6 and MW-10) contained chromium at a concentration above the MCL. The 2013 chromium and cyanide levels from the home well were 50% of the 2011 SI levels, but below the MCLs.

Peninsula Plating Environmental History
In 1992, a Phase 1 audit of the facility occurred. The audit identified improperly stored drums, and regulated materials. The inspection also identified a 2000 gallon and 275 gallon tanks used for fuels and waste oils. The tanks were subsequently removed during later actions.
In 1995, EPA conducted a CERCLA Removal Action at the abandoned plating facility building that contained numerous vats, tanks, drums and small containers of hazardous material left unsecured and abandoned. The materials included flammable liquids, corrosive liquids, oxidizers, cadmium-contaminated liquids and chromium-contaminated solids. The inspection noted the presence of various chemicals used in the plating process including wetting agents, nickel sulfate, sulfuric acid, chromic acid, nickel chloride, and copper cyanide. Only the plating facility was involved in the removal action.

In 1995, and following a history of non-compliance with industrial waste discharge permits, Emergency Planning, and Community Right-to-Know requirements, as well as concerns from the Town of Blades Fire and Police Departments, the company closed. After a site visit by members of the DNREC Emergency Response and Enforcement Branches, the USEPA Region III Emergency Response Team was mobilized.

From August through December 1995, the USEPA Region III Emergency Response Team completed a CERCLA Removal Action at the abandoned Peninsula Plating site. Numerous vats, tanks, drums and small containers of hazardous materials were found unsecured and abandoned. The materials were identified, consolidated and removed from the site for disposal. The building and vats were decontaminated and the entrances to the buildings were secured. According to the On-Scene Coordinator's Summary report, materials removed from the building during the incident consisted of 78 (55-gallon) drums of hazardous waste and 30 cubic yards of hazardous solids and debris.

The purpose of the Site Inspection (SI) was to investigate the possible existence of released hazardous substances at the Peninsula Plating site through the collection and analysis of environmental samples. The media sampled included surface soils, deep soils, and groundwater. Soil samples were field screened by the DNREC chemist and selected samples were submitted for analysis of specified parameters.

The analytical data generated from the collection and laboratory analysis of the environmental samples was subsequently evaluated to determine the potential for human and environmental exposures to hazardous substances. Soil samples were collected from 10 test pits locations throughout the site area. Based on the results of soil samples from the Peninsula Plating property saw elevated concentrations of some metals, most notably carcinogenic arsenic. Arsenic was detected in nine shallow and one deep test pit

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soil samples in excess of screening benchmarks. Other metals that exceeded the screening benchmarks include Chromium, Iron, Manganese, Vanadium, Thallium, and Zinc. Groundwater was not tested during the Removal Action or Site Inspection.

Pathways and Exposure

Geology

The plating properties are located within the Atlantic Coastal Plain Physiographic Province. The Atlantic Coastal Plain gently slopes southeast towards the Atlantic Ocean forming a thickening wedge of unconsolidated sand, gravel, and clay. The sedimentary deposits are underlain by the Basement Complex, which is the continuation downdip of very old metamorphic and igneous Piedmont rocks of northernmost Delaware. The site is approximately 15 to 20 feet above sea level in a relatively flat area, based on the topographic map. The major hydrogeologic system of the study area is comprised of four geologic divisions, which include (from youngest to oldest): the Nanticoke Deposits, the Beaverdam Formation, the Manokin Formation, and the St. Marys Formation.

The Nanticoke Deposits include the Columbia aquifer and are an unconfined water table aquifer. The second stratum is the Beaverdam Formation and aquifer. In addition, in regions where the Manokin aquifer is in direct contact with the Columbia aquifer, they function as a single hydrologic unit. The St. Marys Formation forms the low permeability base of the fresh water shallow aquifer system. The Columbia Group aquifer is recharged through precipitation, and in turn serves as the source of recharge to underlying aquifers. This aquifer also yields most of the fresh water used in this area.

The Delaware Geological Survey regionally mapped the area and identified that the top 20 feet of the Columbia consists of shallow clean sand dune deposits and 10 feet of sandy Nanticoke deposits. The top of the Beaverdam formation is approximately 20 feet thick and is heterogeneous. The aquifer can be 50-100 feet thick consisting of variable sediments ranging from coarse sand and pebbles to fine silty clay. Water levels in this aquifer range from 1 to 18 feet below the land surface, and the saturated thickness ranges from approximately 30 to 100 feet. Local variations in lithology and saturated thickness result in varying transmissivities in this region.

Surface Water and Sediment

The Nanticoke River is located approximately 2000 feet northwest of the Peninsula Plating property and 1,300 feet from the Procino Plating property. For the Procino facility the Morgan Branch lies at a distance of 1,100 feet to the south of the most contaminated well MW-6. There is no direct surface water pathway between the sites and the river. Surface water coming from the site is expected to flow into the Nanticoke River though a combination of overland flow and through storm drains. Some surface water may flow along the railroad right-of way located to the west of the site.

The Nanticoke River watershed drains approximately 718,000 acres of land in northwestern Sussex County Delaware. The Nanticoke's mean annual discharge is 90.3 cubic feet per second (cfs) measured near Bridgeville, and the general flow is in a southwesterly direction through Delaware. The baseflow of the river is derived from shallow groundwater flow. Due to the watershed's unique resident flora and fauna, as well as the recreational opportunities it supports, the Nanticoke has been designated as a "Water of Exceptional Recreational or Ecological Significance" (ERES) within Delaware's Surface Water Quality Standards.

Because Peninsula and Procino Plating are located within the town of Blades the land use close to the sites have been classified as developed land. However, there are wetlands adjacent to the Nanticoke River located west, southwest, and northwest of the site that are not developed. In December of 1994, DNREC conducted a study of sediment contamination in the Delaware portion of the Nanticoke River. This study showed that the contamination levels of sediment below Seaford were significantly higher than the contamination levels

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above Seaford, with metals proving to be the principal contaminants of concern. According to the National Flood Insurance Rate Maps (1996), the site is located within an area of minimal flooding and are outside of the 500-year flood plain.

However, there is no direct surface water pathway from the site to the Nanticoke River. Due to the lack of direct surface water pathway, no surface water or sediment samples were collected from the Nanticoke River during the SI's.

Groundwater

The Town of Blades provides the potable water supply, utilizing three public wells for its supply. The water supply serves approximately 1,200 residents. Water treatment prior to 2018 consists of filtration, corrosion control, chlorination, and the addition of potassium permanganate, according to Division of Public Health records. Due to the identification of PFAS in the three public wells above the HAL the town of Blades installed a carbon treatment unit on the wells in February 2018. The town wells are located on the adjacent properties 200 feet and 1000 feet north of the subject sites. The wells are screened in the unconfined aquifer, approximately 66 to 96 feet below ground surface. In addition, there are approximately 266 domestic drinking water wells found within one mile of the site.

At the two facilities, inorganic results from the investigations from 1995 to 2016 monitor well samples indicate elevated levels of chromium, iron, aluminum, and manganese in the groundwater when compared to the state and federal benchmarks. These levels are not a result of natural conditions as they were three times the background levels. The local groundwater flow at the Peninsula Plating site is expected to be northwest and has metals and potentially PFAS plume migrating toward the pumping wells and the Nanticoke River. The groundwater flow from the Procino site has been mapped to indicate groundwater flow and a migrating plume flowing to the southeast towards the pumping residential wells and the Nanicoke River.

At the Procino facility the chromium groundwater plume boundaries have been partially delineated. Consistent groundwater chromium concentrations reported for 2012–2015 demonstrates a stabilization in chromium released from soil to groundwater, and a partial attenuation of plume's extent and magnitude from the source. The highest concentration was identified in MW-6 the total chromium sample from this well was at a concentration of approximately 1.17 milligrams per liter. The well is located outside the plating building immediately south of the former location of the Chrome Tanks. The detected concentration exceeded the drinking water MCL of 100 micrograms per liter (µg/L, parts per billion). Offsite observation well samples ranged from 20.7 to 78.5 ug/L in the shallow samples and 24.8 to 65 ug/L in the deeper sample. Samples collected from the residential well locations had a highest reported result of 24.2 ug/L. Cyanide was detected in one drinking water sample collected in April 2011. Although the concentration was low (0.02 mg/l, or 20 ug/1), it merits mentioning due to the uncommon nature of the detection.

Between 2011 and 2015 a southerly groundwater flow and plume direction was established during the SI and confirmed during the RI. These data show the continuation of a decreasing chromium trend, presumably resulting from of the cessation of the former chrome tank release to soil, a reduction in chromium migrating from soil to groundwater, and the resulting attenuation of the size and concentration of the chromium plume. However, the chromium contamination still resides within the soil and groundwater as a plume and is comingled with PFAS contamination. The chromium plume has been observed in 2015 to be approximately 250 feet in length and emanating from the Procino Plating facility.

In 2016 the EPA site assessment manager requested DNREC collect samples from the three shallow public wells due to newly obtained information identified in the site photos of the 2010 Procino Plating PA report. The site photo identified several containers of the chemical Fumetrol 140 which is a PFAS containing

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compound. With the understanding that a plume of electroplating chemicals resides in groundwater and knowing that Fumetrol 140 was mixed in with the electroplating fluids, EPA determined additional investigation was required. The Blades, DE public well sample data was collected on January 22, 2018 and resampled in February 2018 indicating there is a new threat of PFAS and metals contamination in all three public wells above EPA health advisory levels (HAL) of 70 parts per trillion.

A DNREC Division of Water well search documented that all but one of the home wells west of the Site obtain water from screened intervals below fine-grained interbeds at depths greater than 70 feet (70-80 feet in 2 wells 75-85 feet in 1 well; and 100-110 feet in 4 wells). One home well screened from 43-48 feet was sampled in the SI and three times in the RI. DGS drilling logs of older local wells (including the Town public wells) likewise describe fine-grained beds at depths below 20 feet, with well screens set below these layers (65-95 feet for the Town wells) in a deeper, coarser, more productive zone at the base of the unconfined aquifer.

In February and March of 2018 and due to the elevated PFAS results from the public wells, EPA collected samples from 44 residential wells in February and March of 2018. Elevated sample results above the HAL were identified in six wells at concentrations of 364, 298, 196,100, 89, and 83 parts per trillion. The State of Delaware has installed treatment systems on four of the homes due to the elevated levels above the 70 ppt HAL. PFAS has been identified in a total of 14 residential wells near the Procino Plating facility. The PFAS contamination may be comingled with previously identified metals contamination identified from the previous phases of investigation.

Air and Soil

According to the U. S. Department of Agriculture (USDA), Soil Conservation Service (SCS) soil mapping report, site soils consist of the Evesboro-Rumford Association complex. These soils consist of somewhat excessively drained Evesboro loamy sand, loamy substratum. Much of this complex is either farmed, or developed for residential communities. Test pit logs from the Procino and Peninsula Plating investigation show no evidence that the subject sites have received significant amounts of fill materials. The facilities are located approximately 1000 feet from the school, but is surrounded by and within 200 feet of residential street.

From 1995 to the end of the investigation by DNREC in 1999, a total of ten test pits were excavated on the Peninsula Plating site. DNREC sampled both shallow and deep soil. Shallow and deep soil samples were collected from test pits to a maximum of 8' or until groundwater was reached. The test pits were then subsequently backfilled and leveled using the excavated materials. The metals that exceeded EPA's standards included carcinogenic Arsenic, Iron, and Thallium, Chromium, Manganese, Vanadium, and Zinc.

From 2011 to 2016, EPA and DNREC evaluated the soil to groundwater pathway at the Procino Plating site for an industrial use and residential use. Results from the 2015 VCP RI indicated for onsite total chromium concentration in the shallow soil samples at the facility, (0-2 feet below the slab) ranged from 11.3 to 105 mg/kg; Chromium concentration in the intermediate depth (3-5 feet) soil samples ranged from 2.1 to 126 mg/kg; Chromium concentration in the deepest soils (6.5 -8.5 ft) ranged from 11.6 to 199 mg/kg, which was from a sample location directly adjacent to a former tank location. All reported soil total chromium concentrations were below DNREC's screening level / reporting level of 214 mg/kg (DNREC, July 2015). The soil sample results indicate there was a release at some time in the past. Iron was detected in three soil samples at concentrations exceeding its state residential standards. Concentrations did not exceed industrial use for state or federal standards. Other metals were not detected at concentrations more than three times the area-wide background. Volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides and polychlorinated biphenyls (PCBs) were not detected in the shallow or deep soil samples selected for confirmatory analysis at concentrations more than regulatory standards.

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Decision

Based upon the information obtained in the removal action documents, PAs, SIs, Procino Plating's RI, and 2018 sample results from the public and residential well data. PFAS has been confirmed in the shallow groundwater under multiple commercial and residential properties, thus indicating there is a persistent threat to groundwater and drinking water. Due to these ongoing and consistent threats, further action and cleanup activities at the Site are needed to determine if any harmful impacts are ongoing and require continued investigation in the form of a site inspection (SI) to identify the comingled PFAS and existing metals contamination.

Furthermore, DNREC has requested assistance in mitigating the potential threats posed by this Site, and has indicated that they concur with additional site assessment under the NPL guidelines. EPA used a "high" priority designation meaning a number of steps under the Federal Superfund program would be required in the future by DNREC and the Agency. In accordance with EPA's decision regarding the tracking of such sites, the referenced site will be updated in SEMS to indicate that the Site activity with a status of **SI Ongoing (SO), with a "High," (H) priority**. The site will remain open in the SEMS database as EPA conducts the SI and will notify the State of any progress to the SI.

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