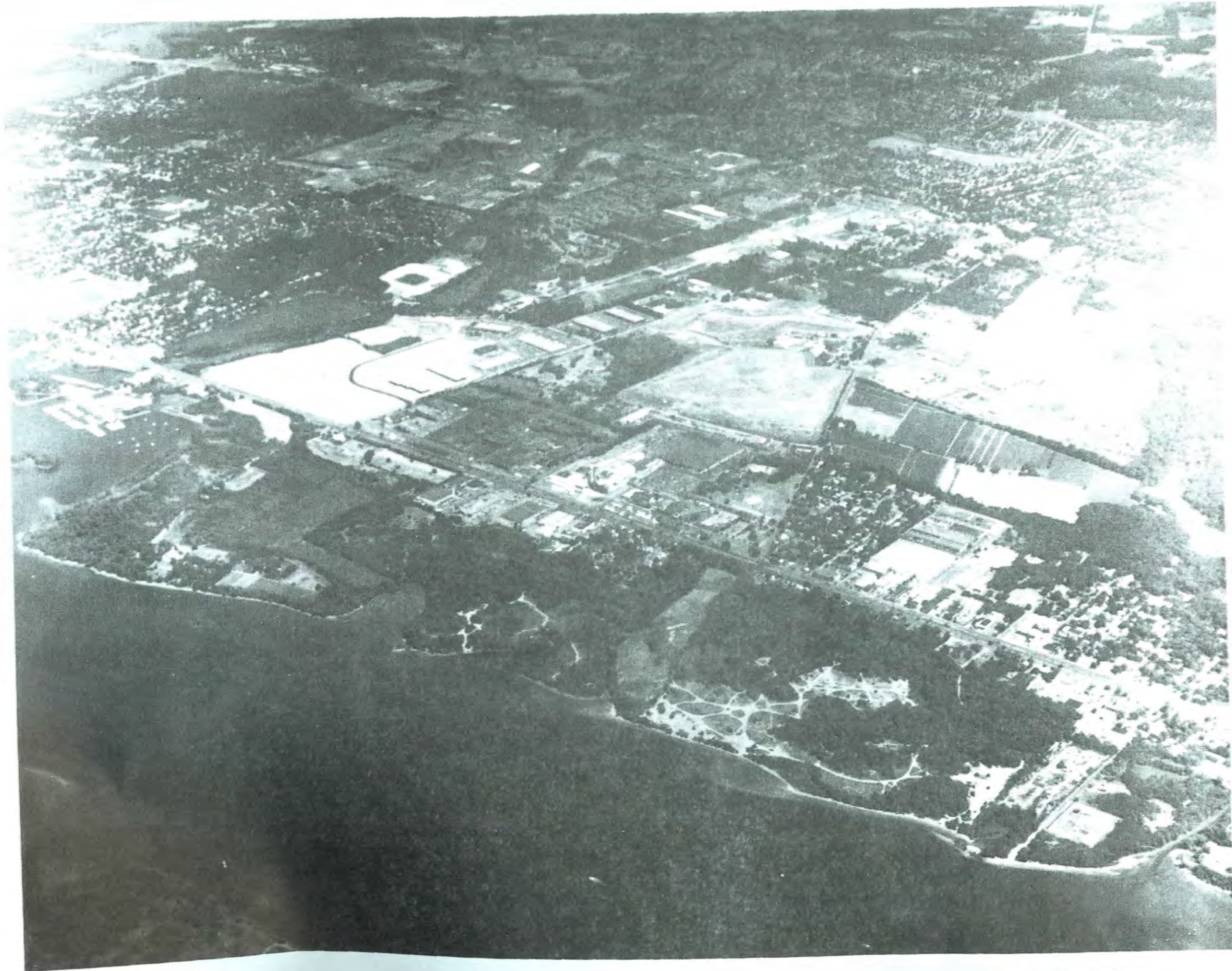


THE CINNAMINSON WATERFRONT TODAY and YESTERDAY

Current state of the riverfront on the Delaware
with an environmental and land use history of the area



Joseph H. Taylor



The 1.6 Miles of River Frontage, June 28, 1988

photo by
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Introduction

Occasionally during past years there has been special interest in the Cinnaminson riverfront, and there was more than usual in 1986 and 1987. Real estate planners and developers tried to change industrial zoning to allow them to build up to 1000 high rise condominiums on vacant land near the Delaware River. The Planning Board, in July 1986, voted 6-1 not to change the zoning, and instead recommended study of one site as a possible public recreation area, including study of financing. The Township Committee, a month later, voted 3-1 not to change the zoning. But no study was then undertaken.

On October 8, 1987, the Planning Board again, unanimously this time, recommended no zoning change, and voted instead - to study the use of the entire waterfront, with the individuals most affected being consulted, and considering the maximum use of the waterfront for all the people of Cinnaminson. The resulting discussions, petitions and presentations became an issue in the 1987 election for two seats on the Township Committee. All four candidates, before the November 3 Election, publicly declared their support for the study.

The intention now is to follow former Mayor Bristow's suggestion that this study be made in 1988 as part of the process of meeting the legal requirement to re-examine and up-date the township MASTER PLAN.

This booklet, therefore, is written to provide facts and background that may prove useful and appropriate in the study process. Offered here is information on what the riverfront is: facts about what exists there now; the present condition of the water and the soil; what lies beneath the surface; and the animals, birds, trees and other plants that are found there. Also, the current owners: who they are, and what is being done with their smaller or larger tracts of river shore property.

Also, presented is an environmental and land use history of the riverfront. This section offers more facts to answer such questions as: How has this river shore area been used over the past 70 years (during the writer's lifetime)? How has the riverfront been used in more than 300 years - since European peoples took over the area from Native American Indians?

Questions about the future of the Cinnaminson riverfront are not dealt with here. What may the riverfront yet become? How and under what terms and conditions may it be shared and enjoyed by all residents? Such questions will surely be included in the public study, but, because they involve opinions and differing points of view, they are not considered in this booklet. Hopefully, all interested citizens will use the opportunity to participate in this riverfront study and the updating of the MASTER PLAN.

OVERVIEW OF WHAT IS ON THE WATERFRONT TODAY

The Cinnaminson waterfront, in the Natural Resources section of the 1983 MASTER PLAN on pages 4, 5 and 6, is referred to in general ways as: "The broad area toward the Delaware River", "an area that has some sort of flood plain or wetness problem" and "the wet areas along the Delaware River". Much accurate information about this township waterfront is not found in the MASTER PLAN, and such information is not easily available elsewhere.

To their credit, the Queale & Lynch authors of the 1983 MASTER PLAN, page 5, in explaining the data given in Plate 3 on Soil Types, state clearly that: "Some areas west of Broad Street (River Road) have been filled since ... 1955 ... so the maps do not reflect current conditions". Also, later on page 5, concerning Plate 4 on Soil Conservation Service Classifications, they warn that the data cannot "be used for site-specific determinations". Plate 5 on Flood Plains & Environmentally Sensitive Areas (and the 1978 Federal Flood Insurance Rate Map for Cinnaminson Township, which is the source for Plate 5) both offer data that give only a broad, general idea of the waterfront area.

The 100-Year Flood Boundary and the extent of the Flood Plain have never been properly determined for most of the Cinnaminson waterfront properties that border the Delaware River. Moreover, still to be delineated are the Freshwater Wetlands boundaries that are now required by the NJ Freshwater Wetlands Protection Act that became effective on July 1, 1988.

Yet much of this Delaware River waterfront area has great potential as a township resource. This open space and mostly undeveloped land is what the 1983 MASTER PLAN on page 32 calls "environmentally sensitive"). True, there are sections that are barren and unattractive. Much of the land has a moderately high to very high water table. There are some sites that are under water all year round. These specially attractive places (little known by most and mainly appreciated by local residents) include:

Tidal Shore, all of it exposed at low tide but covered at high tide - stretches of tidal flats, gravel and stone beaches, and some sand beaches;

Marine Tidal Marsh, at the mouth of the Pompeston Creek, in Wright Cove, and at Plum Point near the former mouth of Swede's Run (now Dredge Harbor);

Plum Point Itself, a favored picnic spot for decades prior to the 1940's (and probably for centuries during Indian times);

A Small Shallow Cove surrounded on three sides by high ground and substantial tree growth. This little cove (about an acre-and-a-half in area and 3 to 4 feet deep at low tide) provides a picturesque harbor for small boats with shallow draft. It also provides scenic views and overlooks that are unusual in this part of the Delaware Valley.

Natural Vegetation, some of small forest proportions, with trees from 12 to 18 inches in diameter. Some of the older and more valuable trees near Plum Point on the Spain property and near Wright Point on the Taylor property are more than 3 feet thick.

Public access to these special attractions, and to nearly all of the township river frontage, however, is very limited at the present time. Most people simply don't know what exists there now. And those who do know find the waterfront difficult to get to.

Beginning at Riverton and the Pompeston Creek, the present day Cinnaminson waterfront runs northward along the river shore for 1.6 miles, to Dredge Harbor and Delran. There are now sixteen separate properties that border this waterfront. The owners of these properties, starting at the Pompeston, include: the Lippincott Boat Works, the State of New Jersey, T. G. Kelly, the Riverfront Development Corporation, the Hoeganaes Corporation, five resident homeowners on or adjacent to the Taylor Farm and Wildlife Preserve, and Justin R. Spain.

Nearby, between these sixteen properties and River Road, in East Riverton and Bellview, there are some eighty homes and two dozen commercial buildings. All of these structures are located within a short block of River Road, and nearly all of them are (probably) outside the 100-year flood plain. A few residences, however, at the foot of Pompeston, Kern and Zeisner streets, and seven more homes on or adjacent to the Taylor farm are definitely subject to river floods.

Following, referring to the Zone Map of Cinnaminson, from SW to NE, is information about these sixteen Delaware River waterfront properties now on the township tax roles:

The Lippincott Boat Works, 11-acre tract at Canal & Pompass Ave. This property has water access to the river by its own basin and the Pompeston Creek.

The State of New Jersey, riparian land, 11 acres between the Pompeston and N. Randolph Ave. (surrounding on three sides the Cinnaminson sewer treatment plant).

The Cinnaminson Sewerage Authority, 5 acres bordering North Randolph Avenue.

T. G. Kelly, 10-acre industrial site, between Randolph and Read Avenues - Now a salvage operation, much of this site (formerly tidal marsh, flood plain and freshwater wetlands) was dredge filled thirty years ago, in 1957.

The State of New Jersey, riparian land, 1 acre (apparently the river end of Read Avenue itself).

Riverfront Development Corporation, 100-acre industrial site between Read Avenue and Union Landing Road (now vacant) - This site has been held for development ever since the 1957 dredging of the 40-foot river channel by the US Army Engineers. (In that time the property has changed hands at least once.) In the 1960's there were dreams of a deep water port at this site.

Some 70 acres (formerly tidal marsh and freshwater wetlands) were filled by dredging in 1957 with sand, gravel, water-washed stone and heavy rock blasted, pumped and barged from the river channel.

Another 30 acres may still be freshwater wetlands; they have long been banked in by the dredged fill. These 30 acres are not well drained, and here a mosquito control pond has been dug by the Burlington County Mosquito Control Commission.

Much of this site, that was formerly under water at high tide, now has elevations of 15 to 25 feet. This higher ground has considerable vegetation that has grown up there in the past 30 years.

Hoeganaes Corporation, 34-acre site - This property is drained and divided by a small tidal stream. The section down-river from the stream is used as a disposal area. Much of this dredge-filled site was formerly tidal marsh and freshwater wetlands

The State of New Jersey, riparian land - 20 acres between the Hoeganaes and Taylor properties - This site includes nearly all of the Small Shallow Cove referred to previously. Much of the land is high (20 feet elevation) with considerable vegetation and offers some of the best scenic views of the riverfront.

The Taylor Farm and Wildlife Preserve - 120 acres. Nearly 30 tillable acres of fertile soil are used to produce a limited volume of organically grown fruit, vegetables, hay and straw which are marketed directly to the public. The farm operations and the seven homes on or adjacent to them are protected from flooding (most of the time) by a man-made dyke or levee with its own privately maintained stormwater drainage system consisting of sluices and tide gates (more on this later).

The 90-acre Wildlife Preserve includes 60 acres that have remained swamp, tidal marsh and freshwater wetlands since the Native American Indians used the land in the 1600's. Another 30 acres of former swamp, tidal marsh and freshwater wetlands were dredge filled in 1957. Over the last thirty years, since the dredging, this area has made encouraging environmental recovery - with significant tree growth, underbrush and surface water resources that provide good habitat for animal and bird life. Where the drainage was blocked by the dredge material, another pond has been dug by the County Mosquito Commission.

An open space, conservation easement runs with the land in perpetuity, protecting these 90 acres from all industrial, commercial and residential building. This easement has been made by deed with the N.J. Natural Lands Trust, an agency of the State of New Jersey, under the Department of Environmental Protection. Under the terms of this deed, only buildings for agricultural, educational, museum or passive recreational purposes are permitted. Under the language of the deed "The easement premises:

"... is wildlife area supporting a large variety of plant and animal life, some of which has become rare and in danger of vanishing,"

"... acts as an instrument for natural flood control by accepting run-off water from storm sewers serving Taylors Lane and River Road; by soaking up natural rainfall in its soil and root systems; and by providing an emergency basin of more than fifty acres ... which is available to accommodate the Delaware River flood waters during abnormally high tides and during severe storms of heavy rainfall,"

"... constitutes a natural oasis in an increasingly industrial and commercial surrounding, and remains the only operating farm fronting the Delaware River between the cities of Camden and Trenton."

Residences, owned by S. Judson, S. & J. Taylor, B. Snipes, L. Tatum, and J. & R. Fergus. All of these homes are on or adjacent to the Farm and Wildlife Preserve. Three of them are on sites that once were part of the historic farm. All are in the flood plain, protected from flooding (most of the time) by the privately maintained dyke, sluices and tide-gates.

The L. Tatum & J. Taylor Sluice and Tide-Gate, straddling the dyke at the NW corner of the J.R. Spain tract. This is part of a court ordered settlement of litigation over drainage rights and responsibility for maintaining the protective dyke, made when the property was owned by the Shell Oil Company. It represents a continuing lien on the use of the Spain property.

The Justin R. Spain 50-acre industrial site at Taylors Lane and River Road and bordering the Delaware River at Plum Point (now vacant) - This tract has also been held for development for the past thirty years, during which time it has changed hands several times. Shell Oil's hopes for a deep-water port and oil refinery at Plum Point were abandoned during the time of Governor Cahill. Another frustrated owner called it "onerous and burdensome".

Some 30 acres of this site are flood plain, tidal marsh and freshwater wetlands, what the MASTER PLAN speaks of as "environmentally sensitive", as they have been for centuries. In most years, these acres are protected from flooding by a section of dyke that must be privately maintained. This area is heavily wooded with some very large trees, especially nearest to Plum Point and the river. Two rare plants and a number of other plants restricted to freshwater inter-tidal marshes are found there. Another Burlington County Mosquito Control pond has been dug there.

Only about 5 acres of this whole 50 acres was ever dredge-filled (55 years ago, in 1933). This filling was only 3 to 5 feet deep, and this area, like the similar area on the Taylor Farm, has restored itself to a high degree, with substantial tree growth.

About 5 acres of the entire 50 acres are covered with a black industrial waste material, to a depth of from 2 to 10 feet. This was done, in the 1950's and 60's, under the Shell Oil Company ownership, on a narrow strip adjoining the old dyke next to Dredge Harbor. This black-covered strip has not restored itself enough to support plants and trees.

The 20 acres nearest to River Road have elevations of 10-17 feet. Drainage from these acres flows two ways: some into Dredge Harbor and some into a small pond bordering Taylors Lane which itself drains under the unpaved gravel lane into the Farm and Wildlife Preserve.

WATERFRONT GEOLOGY - SOIL AND WATER

First, some visible New Jersey geology, a look at what lies above the land surface, particularly the water and land surface that is characteristic of the Cinnaminson waterfront:

The Delaware River flows out of New York State, among the mountains and highlands of northern New Jersey, and then across the rolling upland areas that geologists call "The Piedmont". Where it reaches a stretch of rapids at Trenton, the river drops down, off the higher Piedmont, to "The Inner Coastal Plain". Then, from Trenton to Wilmington, DE, the boundary between the Piedmont and the Inner Coastal Plain continues southwest on the Pennsylvania side of the river, running through Langhorne, PA, and the Queen Lane Reservoir in Philadelphia. The Delaware River waterfront of Cinnaminson, therefore, lies close to the western edge of the Inner Coastal Plain.

The land surfaces in Cinnaminson, including the exposed surfaces at the water's edge along the river shore, are a mixture of sand, clay and gravel. As previously noted in the OVERVIEW OF WHAT IS ON THE WATERFRONT TODAY, there is now a wide variety of land surface conditions. Former tidal marshes and other low areas (altogether some 150 acres on the Cinnaminson riverfront) have been dredge-filled with material from the river channel, while the surfaces of other acres remain relatively undisturbed, much as they have continued for centuries.

The soil on the dredge-filled acres is described by the USDA Soil Conservation Service as: "Made land, dredged course material (Ma)". The following USDA/SCS description of dredge-filled "made land" on Hawk Island, Delanco, also describes what has actually happened on the "made land" since the dredging in 1957 on the Cinnaminson riverfront:

"... The material includes enough fines to make revegetation possible. Many perennial weeds, river birch, sycamore, black locust, red maple, boxelder, and willow invade rapidly ...".

A small area of some 5 acres on the Spain property is described as: "Made Land, sanitary landfill (Mg)". (See the Soil Survey, Burlington County, Map Sheets Numbers 12 & 20, and pages 34-35 for the above descriptions and more.)

The soil on the relatively undisturbed riverfront acres is described by USDA/SCS as "Klej fine sand, 0 to 2 percent slopes (KoA)". Their description continues in part:

"... These soils form on terraces adjacent to the Delaware River ... The native vegetation on river terraces is a hardwood forest that consists mostly of black oak, white oak, and hickory ...".
(Soil Survey, B.C., Map Sheet No. 20 and pp. 29-30)

A small area of some 8 acres, again on the Spain site, is described by USDA/SCS as "Galestown sand, 0 to 5 percent slopes (GaA)". (Soil Survey, B.C., Map Sheet No. 20 and pp. 23-24)

Second, some invisible geology of the waterfront, a more difficult look at what lies beneath the surface, down under this very special section of the township:

The solid base rock, which is so prominent above the land surface in the highlands and mountains of North Jersey, slants markedly downward toward the south and east, moving underground at or near the Delaware River, where the Piedmont stops and the Inner Coastal Plain takes over. Here at the Cinnaminson river shore in West Jersey, our base rock is already some 50 feet down and falling away deeper and deeper toward the east and south. (Some solid rock had to be blasted loose and lifted out of the river channel when it was being dredged to the 40-foot depth.) By studying the depths of water wells, and by seismic "listening" it has been determined that the base rock in Mount Laurel is some 150 to 200 feet deep; at Island Beach it is down more than 3,000 feet, and at Cape May more than 6,000 feet below sea level.

The sandy soils that are so common all over South Jersey are the geologic result of the Ice Ages of 100,000 to 1,000,000 years ago. The enormous Ice Sheets never got as far south as Trenton, but their effects on Cinnaminson were tremendous.

The freezing of the great glaciers lowered the sea level perhaps as much as 200 feet. Then ages later, the melting of those glaciers sent huge floods and torrential waters draining over Cinnaminson and the Delaware Valley - on their way to the lowered sea. Over long periods, these flooding waters raised the sea level again, perhaps as much as 300 feet. The flooding and draining process, over the ages, deposited silt - mixed layers of clay, sand and gravel on top of the base rock.

Therefore, the contribution of the Ice Ages to this part of West Jersey was laying the foundation under our surface soil and under the bottoms of our ponds, lakes, creeks and Delaware River. This foundation consists of all those mixed layers of clay, sand and gravel that were laid down on the slanting but solid rock base by the over-flooding sea during the Ice Ages.

Also, and very significantly, existing in these mixed and alternating layers of clay, sand and gravel, is the water-bearing aquifer known as the Potomac-Raritan-Magothy (PRM), the most important public and private groundwater source for much of West and South Jersey. Most large industrial and public water supply wells in this area pump their water from this aquifer.

There is concern that this PRM aquifer is being over-pumped and that this over-pumping is drawing salt water and other pollution into these wells. Furthermore, because the aquifer near the Delaware River is so close to the earth's surface, what has been done and what may yet be done to disturb the land surface above this aquifer may threaten our life supporting groundwater supply. Especially by the waterfront, where the aquifer lying on its rock base is so critically close to the land surface, the driving of more pilings or digging and pouring more concrete foundations for large buildings could be a disastrous mistake.



Small Shallow Cove

INDIAN SETTLEMENTS, TRAILS and TRAVEL

The Indians of Cinnaminson were of the Unami or Turtle Tribe of the Lenni-Lenape. Lenni-Lenape meant "original people", which reminds us that they were the native Americans. In their language, Cinnaminson meant "sweet water", Pennsauken was "crooked river", Pompeston signified "bread in a miry place" and Tacona (Tacony, the home of related Unami people meant "woodland".

Two Indian settlements were in Cinnaminson when Europeans began arriving in the 1600's. One of these was near the fork of the Pennsauken Creek, what we now call the Fork Landing section of our township. The other was near Plum Point and what then was the junction of Swede's Run and the Delaware River. This latter site has now been dug away and made into Dredge Harbor. The locations of these Indian villages are indicated by stone mortars and pestles, sinkers, axes, and spear and arrow points that are occasionally still found on the waterfront.

In 1677 the Indians agreed to a deed giving Europeans the use of all unoccupied land between Timber Creek (just below the Walt Whitman Bridge) and the Rancocas Creek (just above Delran and Riverside). By another deed in 1684 the Indian lands around Fork Landing were turned over to white settlers.

The Indians used the land and its natural resources for hunting and farming. They hunted not only local birds and animals; they also journeyed eastward across New Jersey to get salt water fish, clams and oysters. They used the Delaware Valley waters for freshwater fishing, and for travel and transport. By canoe they kept in touch with their Unami relatives across the river in Tacona. They paddled up-river to the Trenton region to obtain the hard flint and stone preferred for arrowheads and spear points.

Relics also indicate that two east-west Indian trails began at the Delaware here in Cinnaminson. The earliest trail started from Plum Point at the foot of what became Taylors Lane and New Albany Road, passing what became Delran, Moorestown, Mount Laurel and Medford, and on through the woods and Pine Barrens to the sea. The second trail followed generally the course of the Pennsauken Creek; it has become Cinnaminson Avenue, Lenola Road and Fork Landing Road.

The Dutch, Swedish and English settlers, for their early years in the New World, followed native ways of using the land and waters. There were few clearings. Removing trees and forest for roads and farms was hard slow work. Land travel was difficult, even along the established trails. The main highways at first were the Delaware River and the smaller streams that ran into it.

LAND USE NEAR THE WATERFRONT - SPARSE DEVELOPMENT

The colonial newcomers to Cinnaminson found that most of the best places for settlement were some distance back from the riverfront, where the streams are narrower, shallower and easier to ford or ferry across. They built their homes and barns and other work places on the higher (and drier) land a half-mile or more away from the river shore. They did their farming and other business where the soil is better drained and where their work would not be washed away by river floods.

Gradually, along the higher ground north of the settlement at Fork Landing, there came to be neighborhoods that have since been known as Westfield, New Albany, Fairview and Bridgeboro. By the early 1700's, travel and transport between these small settlements led to a north-south trail that was used increasingly for land travel and transport. After improvements in 1748 it was called "The Great Road from Burlington to Coopers Ferry". (Cooper's Ferry was an early name for Camden.) Later known as the Burlington Turnpike, then as the Burlington Pike and still later as NJ Route 25, this is now Cinnaminson's Main Line, (US) Route 130!

To supplement the two east-west Indian trails, in 1720-21, the settlers laid out a third road that followed the general course of the Pompeston Creek. This third route, for travel east from the river, gradually superceded in importance the Taylors Lane-New Albany Road from Plum Point. The Pompeston Creek route has now become the Riverton-Moorestown Road.

The Cinnaminson riverfront from early Colonial times until the late 1880's ran up the river from the Pennsauken Creek to the Rancocas Creek. In 1860, when Chester Township was dissolved and divided into Cinnaminson and Moorestown, Cinnaminson Township then included all of the uplands, lowlands, creeks, and streams that later became the separate municipalities of Palmyra, Riverton, Delran and Riverside. Citizen pressure for more home rule in these new riverfront towns, during the following three decades, took away from Cinnaminson the Delran and Riverside frontage on the Rancocas and the Palmyra and Riverton frontage on the Delaware River. By 1894, the Cinnaminson riverfront had been cut by 60%, from 4.2 miles to the present 1.6 miles.

The land and river frontage given up by Cinnaminson, especially what became Palmyra and Riverton, was more desirable for building development. Much of the remaining and present day 1.6 miles of Cinnaminson riverfront has never been built on- because so much of it is tidal marsh, freshwater wetlands and within the flood plain.

What is now the Cinnaminson waterfront was sparsely settled all through Colonial times and has continued sparsely settled right up to the present. This fact is confirmed in part by a large 1849 roll map of Burlington County in the writer's possession, and also by the map of Historic Cinnaminson in about 1880. The 1966-67 Topographic Map by the US Geological Survey shows a dozen houses in the area. However, seven of those homes near Riverside Drive in Bellview, although still in the flood plain, are no longer on the riverfront. For these homes their scenic views of the river were wiped out and their access to the river largely destroyed by the 1957 Delaware River channel deepening which piled high the dredge material on many acres of tidal marsh and freshwater wetlands, moving the riverfront some 1200 feet to the northwest.

Reasons for continuing sparse development of the Cinnaminson waterfront are pointed out in these quotations from the 1983 MASTER PLAN:

- pp. 5&6 "Development should not occur in the obvious flood plains and tidal marsh areas. Preferably it should not occur in the areas with moderately high water tables,"
- p. 23 "There are several basic features in the township which will continue to influence development patterns. The major ones are the barriers created by Route 130, the railroad, and the flood plains and Delaware River,"
- p. 27 "... at the time of site plan review, the industrial area along the Delaware River is proposed to be developed with low lot coverage with provision being made to preserve public access along the river for recreational and aesthetic purposes."
- p. 32 "The major recreation proposal is to anticipate a waterfront park along the Delaware River between North Read Avenue and Union Landing Road as part of site plan designs for industrial uses. Recent improvements to the water quality along the Delaware make such a consideration possible and make the area a unique natural feature which can be used for the benefit of the entire community. In addition, the use of the river for recreational pursuits will be compatible with the dedication of the Taylor Farm as a wildlife preserve. ... The result can be a positive, aesthetic use of the area, not a forgotten dumping ground. Even the landfill site can be planned for landscaping and improvement as an open space area to complete a riverfront plan."
- p. 32 "It is the intent of the plan that environmentally sensitive areas be avoided by development. ... It is intended that all environmentally sensitive areas be retained for their natural flood control purposes."

TIDES, FLOODING and RIVER SIDE FARMING

The Delaware River estuary, from the rapids or "Fall Line" at Trenton where it drops off The Piedmont to the Inner Coastal Plain, all the way to Cape May and the ocean, is subject to the tides. Normally at Cinnaminson, high tides are about five feet higher than low tides. Except at "slack-water" when the tides are changing, the currents here run up to 3 miles per hour, and they can help or hinder progress in boats - especially sailboats in light winds!

Flooding and threats of flooding are becoming a way of life for some Cinnaminson residents, largely because so much former farmland and open space has been sealed over with buildings, streets and parking lots. When water from snow or rain falls on open fields or wooded areas, some is taken up by plant roots, some seeps and filters slowly into natural streams, and some may help to re-charge the underlying PRM aquifer. Under such natural conditions it takes more rain or snow and more time for streams to flood. But, when open space is mostly gone and precipitation is guided instead by down-spouts, curbing, gutters and storm sewers, the storm water runs off rapidly. And under such un-natural conditions streams may flood quickly and more often. The flood waters then enter people's yards and basements, causing damage and complaints. Flood insurance and the new 1987 Flood Damage Protection Ordinance are efforts to mitigate the problems. (See Flood Insurance Rate Map for Cinnaminson, published in 1978 by US Dept. of Housing & Urban Development.)

The waterfront along the Delaware River floods less often than the smaller creeks because the river is so much bigger. The river here is half a mile wide, and there are low lands near the river that can accept high water (up to a point). Without flooding, Old Man River can handle storm water from a lot of smaller streams, and even from roofs, parking lots, streets and storm sewers. But there are limits, and flooding does happen.

Several natural events all occurring at the same time can set the stage for the Cinnaminson waterfront to be flooded by the Delaware. These triggering events are: heavy, soaking rains or melting snows, extra high tides, and very strong south wind that backs up the water in the long south-flowing stretch of river and bay below Wilmington. In addition, if soaking rain or melting snow has occurred over much of the upper Delaware watershed, and if an advancing flood crest arrives close to Cinnaminson right at high tide, then a flood is very likely. Many times, however, in the writer's experience, the river has been level full, lapping at the top of protecting dykes, waves making heavy spray or even washing over the dykes in spots - but then the threat passes, and the extra water flows on down-stream with the falling tide on its way to the ocean.

During the two centuries following the Indian settlements there probably were floods of the Delaware River, but the writer has found no records of them. In this century there have been nine floods of the Cinnaminson waterfront, three in the first fifty years and six more since. The first two were 30 years apart, in 1903 and 1933. The third, after 17 years, came in 1950. The fourth and fifth both came in 1955, just a week apart, along with hurricanes Connie and Diane that wrecked so much havoc in the Stroudsburg area. There were four more, in 1973, 1978, 1979 and 1980.

Three century-old waterfront farm homes at Taylors Lane have survived all the floods since they were built. The oldest was erected probably in the 1750's, one in 1855, the third in 1886. They are situated on what the Indians called "The Island" - land that is elevated just enough for their sites to be above water for the past 200 years. During floods, these old farmhouses have been accessible only by canoe or rowboat and their residents have suffered with two feet of water in their cellars, but the houses have endured without structural damage beyond expected old-age depreciation. They are valued by those who know them as part of Cinnaminson's cultural heritage.

The Island, which has helped to keep these waterfront homes and their barns and outbuildings from washing away has been important in another way. It has been an essential key to the unusual farming system of managing land and water that is still being practiced here in Cinnaminson, as well as down river in Salem and Cumberland counties, and behind the dykes of The Netherlands on the North Sea.

This kind of farming requires hard work of three kinds: first, the raising of a bank or dyke separating wet, swampy land from the tides at the river's edge; second, laying under and through the bank, large pipes fitted with tide-gates on their ends toward the river; and third, digging ditches to allow the trapped waters to reach the pipes and drain into the river, when the tide is low enough. When the tide rises again, the tide-gates close and keep the river water from coming back inside the bank. After a time, land that was wet and swampy dries sufficiently to support productive agriculture. The places where the pipes drain through the river bank are called "sluices" or "flood gates".

In the past, this system was practiced on several farms in Cinnaminson and Delran. Their river bank extended continuously from the Pompeston to "Charles Haines' Flood Gates" at Swede's Run, and from there on to the Rancocas. Sections of the bank were put in place 200 years ago by men using shovels, wheelbarrows and horse- or mule-drawn scoops. By common agreement, each farmer maintained his section of the single long serpentine bank. A break or washout of any one farmer's section meant that all would probably be flooded several times each month (at new or full moon) until the break was mended.



August, 1933 on Taylor's Farm



November, 1950 on Taylor's Farm
Barns and Homes in the distance on "The Island"

This one long dyke or river bank, from East Riverton into Delran, was intact and functioning in the 1920's and early 30's. The owners of all of the protected farms worked together to keep their respective sections in good condition. But after the 1933 flood which badly damaged it in several places, the sections in East Riverton, Bellview, and Delran were not repaired and were never used again. The sections on the Parry farm (since owned by Shell Oil, and now by Justin Spain) and on the Taylor farm were repaired as soon as possible, and when necessary since. The Shell Oil Company was very helpful in repairing the serious damage caused by the flooding in 1979.

The Cinnaminson people most affected by Delaware River floods are those who live and work on Pompass, Zeisner and Kern streets and at the foot of Taylors Lane. When the 40-foot river channel was dug in 1957, and the dredge fill was piled up 20 and 25 feet high (covering over more than 150 acres of tidal marsh and freshwater wetlands) the whole operation had several effects on the residents of East Riverton and Bellview. It not only cut off scenic river views and their ready access to the river shore and its attractions, but, by coincidence, it also replaced the old river bank and restored some flood protection.

Flood waters from the Delaware can still reach homes on Pompass Avenue by way of the Pompeston Creek. River flooding can also reach homes at the foot of Zeisner Street by the little tidal stream that drains part of the Taylor Wildlife Preserve and the 20 acre State of New Jersey riparian property and runs through the Hoeganaes property north of Union Landing Road. River floods have surrounded 6 of the 7 homes on or next to Taylors farm, requiring the use of boats for access to the dry section of Taylors Lane and River Road.

To the writers knowledge there has never been any loss of human life from floods of the Cinnaminson riverfront. There have been flooded cars and trucks and wet cellars. Serious erosion and washouts have damaged river bank, dirt lanes and some open farm fields where protection from the roots of trees and shrubs was absent or minimal. But no important buildings have been undermined or washed away.

The flood waters of the tidal Delaware are short lived, usually occurring during only one high tide or two successive high tides. They usually last only a few hours or at the most a couple of days. The Cinnaminson people most affected learn to live and cope with the difficulties.

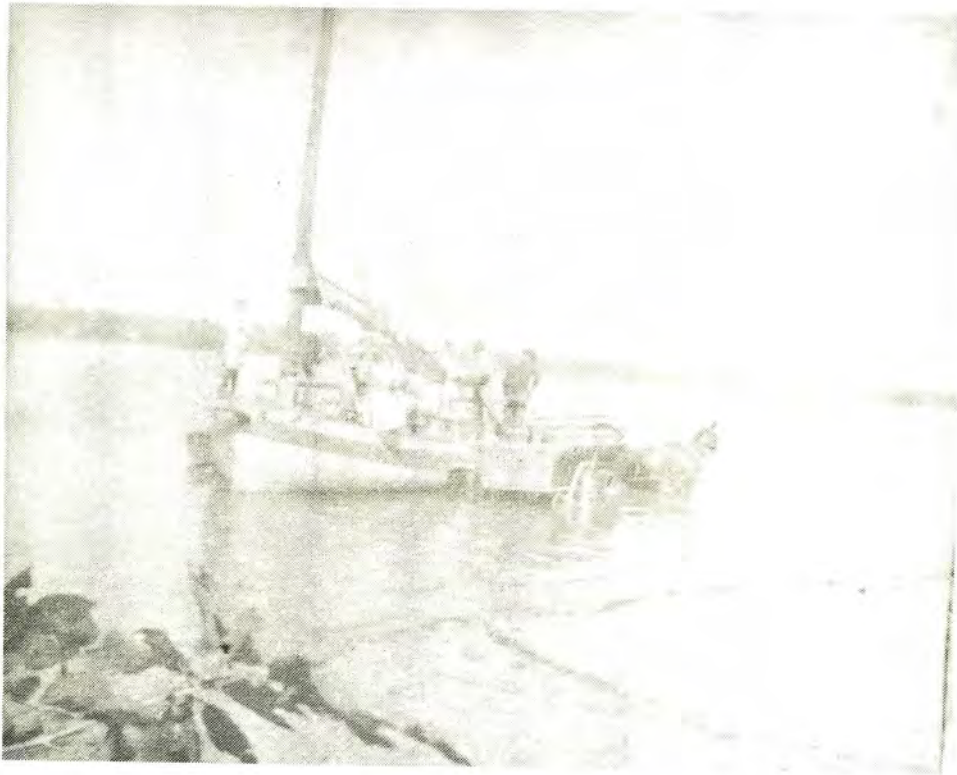
RIVER BOATS for FREIGHT, COMMUTERS & PLEASURE

Ocean-going sailing ships, and smaller sailboats (aided by oars and tides) for inland waters, were all the Europeans had for their first 140 years in the New World. The earliest settlers to cross the Atlantic from Holland, Sweden and England seem to have landed down-river in Salem County or Chester, PA, or up-river at Burlington, and then made their way to Cinnaminson by small boat or overland on horseback or by horse and wagon. Many came later to the growing port of Philadelphia and were ferried across the river.

Union Landing on the Delaware and Fork Landing on the Pennsauken became waterfront centers in Cinnaminson. And Union Landing Road and Fork Landing Road were busy with the horse, mule and wagon traffic. As more and more horses were kept in the city, Philadelphia had sanitary waste problems, even then. They had to get rid of the piles of horse manure from their streets and stables. So they loaded tons of manure on barges and used the river and creeks to float a lot of it to West Jersey farmers who were glad to have it for fertilizer. (The writer has been told by farmers no longer living that pieces of broken brick that are still found in Cinnaminson farm fields probably came along with the manure from the Philadelphia stable floors.) The manure barges were common until the early years of this century and the coming of horseless carriages. For two centuries the same "landings" or docks (but hopefully not the same barges) were used for water transport of other freight and farm produce.

From about 1875 to 1910 the shallow draft market boat "Gem" was sailed by Gardiner Taylor and Edward Hunter, carrying fruit, vegetables, firewood, hay and straw from the Charles Haines, Hunter and Taylor farms to the wharf near what developed into Dock Street Market in Philadelphia. To load this market boat, wagonloads of produce were driven over the river bank and down the gravel shore, right into the river up to the horses' bellies, and alongside the boat. In this way, sailing when the wind was right, rowing when the wind failed, and using all the help they could get from the tides, they carried quantities of farm products to the city.

As travel across the river increased, Cooper's Ferry began service between Camden and Philadelphia. But for years, all land travel over "The Great Road from Burlington to Cooper's Ferry" was interrupted by a number of boat rides! Travellers had to take ferry breaks to cross Cooper's Creek and Pennsauken Creek until 1772. The ferry was the only way to cross the Rancocas Creek at Bridgeboro until after the Revolution in 1793. Before the coming of the railroad in 1833 there was no River Road better than a sand track. And it was in 1866, after the Civil War, when foot traffic and horse traffic finally had a bridge instead of a ferry for crossing the Rancocas between Riverside and Delanco.



Loading the Market Boat from Taylor's Farm
(early 1900's)



Hauling in Shad at Wright Point
(early 1900's)

The coming of steamboats brought dramatic improvement in Delaware River transit in the early 1800's. The pier at what later became Riverton and the wharf at Burlington became regular stops for freight and sometimes passengers. The barges for manure, coal, firewood and other heavy freight were then pushed or pulled by steam-powered tugboats built to cope with the shallow waters of Union Landing, Fork Landing and such nearby places as Chew's Landing on the Big Timber Creek in Runnemedede and Borton's Landing on the Rancocas in Moorestown.

Over the years, sailing ships, paddle-wheeled steamboats, propeller-driven steamships and motor vessels have been watched by many from the Cinnaminson waterfront, but few of such larger boats have docked or tied up on the West Jersey side of the river any closer than Camden or Burlington. However, by the early 1900's, passenger cruise boats and some commuter boats made regular stops at the pier now used by the Riverton Yacht Club.

For nearly 200 years West Jersey people had to use ferries to get to Wilmington or Philadelphia or Bucks County. Ferry rides crossing the Delaware were often exciting trips, especially for families with children. During storms or fog, or when the river was choked with ice, they could be dangerous. Driving teams of horses with wagons or carriages was often trouble enough on dry land in the 18th, 19th and early 20th centuries, but getting these draft animals and vehicles on or off ferry boats could be more adventurous. This was especially true when the tide was low and the gangplank roadway between ferryboat and shore was steeply inclined.

The Camden-Philadelphia ferries were operated for several years after the Ben Franklin Bridge was built in 1926. Ferries made thousands of crossings between Palmyra and Tacony for seven years in the 1920's, until replaced by the Tacony-Palmyra Bridge in 1929. And between Burlington and Bristol the "Billy Doran" ferry, named for its owner and operator, continued service until the bridge there was finished in 1931.

Freighters today are loaded and unloaded at the Northern Metals pier across from Riverton. These and other large ships carrying iron ore to the U. S. Steel plant in Morrisville have the right of way over car and truck traffic on the two bridges run by the Burlington County Bridge Commission.

Small sailboats have long been enjoyed for recreation on this stretch of the Delaware. In the late 1800's, before baseball and bicycling became so popular (and before the river became a smelly, open sewer) several classes of 15-foot boats were raced and used as family day sailers. During the 1920's and 30's the "L I's", sneakboxes, Stars, Comets and many "mongrel" or few-of-a-kind craft were popular. The 12-foot Duster - so named because it could sail in very little wind- originated in Riverton. Because the Dusters were relatively inexpensive and easy to build, many of these shallow V-bottomed boats were made and sailed off the Cinnaminson waterfront beginning in the Depression of the 1930's.

For centuries Cinnaminson people have had rafts, canoes, rowboats and sailboats on the Delaware. For decades they have had inboard and outboard motorboats. But enjoying the river with pleasure boats and for fishing and swimming has been difficult or impossible for many, because public access to the waterfront has remained so limited. There is much demand for a local boat launching ramp with adequate parking space. But there is no such public facility either here or in any nearby municipality either upstream or downstream on this side of the river. Probably no one municipality will agree to undertake such responsibility. Perhaps one or two counties might be persuaded that it ought to be done.

Now that the Delaware is again becoming a clean river, recreational uses are rapidly increasing. Boating, water skiing, swimming and fishing are all on the increase. Quite a number of people who can manage to get to the waterfront come just to walk (or to walk their dogs) and to enjoy the scenic views and the wonders of plant and animal life.



Foot of Randolph Avenue - Hot Summer Afternoon

THE RAILROAD CHANGED CINNAMINSON

The Camden & Amboy Railroad, more than 150 years ago, cut right through Cinnaminson, making it much easier for passengers and freight to move north and south near the Delaware River. The railroad here ran only half a mile from the riverfront, and population and development increased steadily. Before the rails came, "Dunk's Ferry" (Beverly) was the only riverfront town between Camden and Burlington. But Palmyra, Riverton, Delran, and Riverside (as well as the wagon track connecting them - what we know as River Road) all got their real start from the vastly improved transport that ran on rails!

The line was first completed from Perth Amboy to Bordentown, when it was planned to take passengers on down the Delaware by steamboat to Philadelphia, with a light-rail branch line between Bordentown and Camden for use in winter when the river filled with ice. But, after a short trial, the boats down the river, were given up, and the right-of-way through Cinnaminson, quickly became part of the main line. In fact, the entire route, from the ferry across the Hudson in Perth Amboy to the ferry across the Delaware in Camden, was for some time the longest railroad in the United States!

Coming south from Bordentown in 1833, construction had to stop when they reached the Taylor Farm - because they ran out of rails. More rails that came by ship from England had been curled and bent, so they would fit better in the hold of the ship. They were unloaded, heated and straightened at the farm. Some of the horses and mules working on the railroad were fed, watered and pastured at the farm.

Clearing the right-of-way through virgin trees and forest was doubtless hard enough, but running the roadbed across all the streams and creeks on the route required difficult engineering. The Rancocas, Swede's Run, and the Pompeston and Pennsauken, (all part of what was then Chester Township) were only four of the dozen water barriers that had to be bridged on the 25 miles from Bordentown to Camden. And at that time there were no bridges for the wagon track that was to develop into River Road. The bridge over the Rancocas between Delanco and Riverside was not built until 1866.

It was the railroad and the resulting population growth and town development along the riverfront that led to the separation of Cinnaminson from Chester Township and then the partition of Cinnaminson itself. By 1894, Delran, Riverton and Palmyra had all become separate municipalities, and Cinnaminson's riverfront had been reduced to its present 1.6 miles between the Pompeston and Dredge Harbor.

THE RIVER IS GETTING CLEANER - POLLUTION CONTROL

Though improvement is still needed, during the past fifty years there has been considerable progress in bringing back Delaware River water quality to conditions that once again invite enjoyable boating, fishing and swimming. Economic, scientific and educational efforts have resulted in public demands and political will that the river no longer be used as an open sewer. Slowly, municipal, state and federal anti-pollution laws (with the natural, restorative, cleansing action of the free-flowing river itself) have been effective.

Experts seem generally agreed that pollution of the Delaware River Basin was at its worst in the 1940's and early 1950's. Those were the days of massive fill kills, floating oil, municipal sewer grease, and waste from ships and industrial processes. The noxious smelly waters in the river, creeks and streams of West Jersey led people to seek water-related recreation on the East Jersey ocean coast.

In the late 1930's New Jersey, New York, Pennsylvania and Delaware joined to create INCODEL, the Interstate Commission on the Delaware River. Water quality standards were adopted in each of these four states, though little was done to meet these standards and reduce pollution, during World War II. Soon after the war, however, (with major federal funding) cities, towns and industries all over the Delaware Valley began building the wastewater treatment plants required by INCODEL. In the mid-1950's many of these sewage plants began operating, and water quality improved throughout the region.

With the same four states cooperating, the Delaware River Basin Commission (DRBC) absorbed INCODEL's water control responsibilities in 1961. Following a pioneering, computerized water pollution control study of the entire Delaware estuary, by the U.S. Public Health Service, the DRBC was able to adopt new, higher water quality standards in 1967.

Though not among the early respondents to the increasing public, state and federal demand for stricter controls, Cinnaminson got its Sewage Treatment Plant built and operating in 1965. Much credit for this local township progress is due to the late Ruth M. Allen, long-time president of the Pompeston Creek Watershed Association, which she founded in 1963. Statements follow here, as issued at the time by the PCWA, on the subject of sewage treatment in Cinnaminson:

"Pompeston Creek is badly polluted by poorly processed sewerage effluent. PCWA has drawn this to the attention of the proper authorities. The recommendations of a trained aquatic biologist were obtained. Corrective steps are being carried out."

"Marshes are indispensable for ground water recharge, for wildlife and game bird habitat, and as a buffer for flood waters."

"PCWA protested the proposal to build the new Cinnaminson Sewage Plant at the head of tide water, because the effluent would pollute the tidal marsh. The new plant will be built on the Delaware River, and no effluent will be discharged into the tidal marsh."

The present aim of the Cinnaminson Sewerage Authority is to further upgrade its plant from secondary to tertiary treatment. Achievement of this goal, of course, would still further improve water quality on the township riverfront.

The above local and state efforts were aided by the passing of the 1972 Federal Clean Water Act. This provided funding and enforcement powers for the anti-pollution programs.

A comprehensive and well illustrated book entitled THE DELAWARE ESTUARY: Rediscovering a Forgotten Resource (incidentally, it was printed by The Philadelphia Press, located on River Road in Cinnaminson!) has a section on pollution. The following quotation was written by Richard Albert of the Water Quality and Analysis Section of DRBC, (THE DELAWARE ESTUARY, p.125):

"Overall, oxygen levels are better today than any time in fifty to sixty years. ... Fisheries data support the improvement of dissolved oxygen. ... fish - some three dozen species - were residing in the heart of the polluted zone during the worst time of the year. Also, the number of shad running the river appears to be increasing dramatically."

Finally, quoting from Stephen Friant, a senior environmental chemist at the Academy of Natural Sciences in Philadelphia, (THE DELAWARE ESTUARY, p.128):

"... although levels of dissolved oxygen in the Delaware Estuary have improved significantly over the last few decades, much work remains in identifying the role of toxics and their role on the ecosystem."

The toxics here referred to are non-biodegradable pollutants such as PCBs, dioxin and chlordane. They are the subject of continuing concern and research at many places including the Philadelphia Academy of Natural Sciences.

PERTINENT LAWS, ORDINANCES AND REGULATIONS

The study of what is the best use of the waterfront for all concerned must consider New Jersey state law, local Cinnaminson ordinances and regulations of the NJDEP, especially the latter that govern land use on freshwater wetlands and flood plains.

Of fundamental importance is the NJ Municipal Land Use Law which has been in effect for some 35 years. Among the purposes of this act are the following:

"To promote the establishment of appropriate population densities and concentrations that will contribute to the well-being of persons, neighborhoods, communities and regions, and preservation of the environment;"

"To provide sufficient space in appropriate locations for a variety of agricultural, residential, recreational, commercial and industrial uses and open space, both public and private, according to their respective environmental requirements, in order to meet the needs of all New Jersey citizens;"

"To promote the conservation of open space and valuable natural resources and to prevent urban sprawl and degradation of the environment through improper use of land.

The NJ Municipal Land Use Law is the legal basis for the local MASTER PLAN, Planning Board and Zoning Ordinance, all three of which have been functioning in Cinnaminson for more than 20 years. To comply with the state law, the MASTER PLAN had to be updated in 1983, and this is now being done again in 1988.

Former Mayor Bristow has wisely proposed making the riverfront study a part of the MASTER PLAN updating process. This will give later decisions about riverfront land use appropriate rounding in the MASTER PLAN and the ordinances that go with it.

The NJ Freshwater Wetlands Protection Act will also have important effects in Cinnaminson. Use of the freshwater wetlands and flood plain areas, of course, will be subject to State permits, probably from the Division of Coastal Resources of the Department of Environmental Protection.

NATURAL RESOURCES INVENTORY

Animal and plant life found on the Taylor Farm and Wildlife Preserve. Some of these plants and animals are found also on other Cinnaminson riverfront properties, both up and down river from the farm. (Those who know the area will think of obvious omissions. Additions to these lists will be welcomed!)

Mammals: Gray Squirrel Muskrat Meadow Mouse
Raccoon Bat Kangaroo Mouse
White Tailed Deer Skunk Vole
Cottontail Rabbit Opposum

Reptiles: Box Turtle Painted Turtle Snapping Turtle
Red-Bellied Slider Spotted Turtle Garter Snake
Common Water Snake

Amphibians: Spring Peeper Bull Frog *green frogs*
Leopard Frog Common Toad

Insects: Common Blue Butterfly Tiger Swallowtail Deer Fly
Sulphur Butterfly Cabbage Butterfly Tick
Spicebush Swallowtail Mosquito

Birds: Red-Throated Loon Common Loon
Pied-Billed Grebe Horned Grebe
Double-Crested Cormorant

American Bittern Least Bittern
Great Blue Heron American Egret
Snowy Egret Little Blue Heron
Cattle Egret Green Heron
Black-Crowned Night Heron Glossy Ibis

Canada Goose Wood Duck
Green-Winged Teal American Black Duck
Mallard Northern Pintail
Blue-Winged Teal American Wigeon
Canvasback Redhead Duck
Greater Scaup Lesser Scaup
Common Goldeneye Bufflehead
Hooded Merganser Common Merganser
Red-Breasted Merganser Ruddy Duck

Turkey Vulture Osprey
Bald Eagle Marsh Hawk
Sharp-Shinned Hawk Cooper's Hawk
Red-Shouldered Hawk Broad-Winged Hawk
Red-Tailed Hawk Rough-Legged Hawk
Kestrel (Sparrow Hawk) Merlin (Pigeon Hawk)
Peregrine Falcon

Ring-Necked Pheasant Bob White Quail

Birds;
(cont.)

Virginia Rail
American Coot

Killdeer
Lesser Yellowlegs
Ruddy Turnstone
American Woodcock

Laughing Gull
Ring-Billed Gull
Great Black-Backed Gull

Rock Dove (Pigeon)
Black-Billed Cuckoo
Barn Owl
Great Horned Owl
Saw-Whet Owl
Chimney Swift
Belted Kingfisher

Red-Headed Woodpecker
Yellow-Bellied Sapsucker
Hairy Woodpecker

Wood Peewee
Least Flycatcher
Great Crested Flycatcher

Horned Lark
Tree Swallow
Barn Swallow
Common Crow

Black-Capped Chickadee
Tufted Titmouse
White-Breasted Nuthatch
Carolina Wren
Winter Wren

Golden-Crowned Kinglet
Blue-Gray Gnatcatcher
Veery
Swainson's Thrush
Wood Thrush
Catbird
Brown Thrasher

Cedar Waxwing

Common Gallinule

Greater Yellowlegs
Spotted Sandpiper
Common Snipe

Bonapart's Gull
Herring Gull
Common Tern

Mourning Dove
Yellow-Billed Cuckoo
Screech Owl
Short-Eared Owl
Nighthawk
Ruby-Throated Hummingbird

Red-Bellied Woodpecker
Downy Woodpecker
Flicker

Willow Flycatcher
Phoebe
Kingbird

Purple Martin
Bank Swallow
Blue Jay
Fish Crow

Carolina Chickadee
Red-Breasted Nuthatch
Brown Creeper
House Wren
Marsh Wren

Ruby-Crowned Kinglet
Bluebird
Gray-Cheeked Thrush
Hermit Thrush
Robin
Mockingbird

Starling

more

Birds:

White-Eyed Vireo
 Blue-Winged Warbler
 Parula Warbler
 Chestnut-Sided Warbler
 Cape May Warbler
 Blackburnian Warbler
 Palm Warbler
 Blackpoll Warbler
 American Redstart
 Ovenbird
 Common Yellowthroat

Scarlet Tanager
 Rose-Breasted Grosbeak
 Towhee (Chewink)
 Chipping Sparrow
 Lark Sparrow
 Fox Sparrow
 Swamp Sparrow
 White-Crowned Sparrow

Bobolink
 Meadowlark
 Boat-Tailed Grackle
 Cowbird
 Baltimore Oriole
 Pine Siskin
 House Sparrow

Red-Eyed Vireo
 Tennessee Warbler
 Yellow Warbler
 Magnolia Warbler
 Black-Throated Blue W.
 Pine Warbler
 Bay-Breasted Warbler
 Black and White W.
 Worm-Eating Warbler
 Northern Waterthrush
 Yellow-Breasted Chat

Cardinal
 Indigo Bunting
 Tree Sparrow
 Field Sparrow
 Savannah Sparrow
 Song Sparrow
 White-Throated Sparrow
 Junco

Red-Winged Blackbird
 Rusty Blackbird
 Common Grackle
 Orchard Oriole
 House Finch
 Goldfinch

Trees:

Ailanthus
 American Basswood
 Catalpa
 Cottonwood
 American Elm
 Sour Gum

Hawthorne
 Mockernut Hickory
 Black Locust
 Silver Maple

Black Oak
 Pin Oak
 White Swamp Oak

White Pine
 Sassafras
 Willow

White Ash
 River Birch
 Wild Black Cherry
 Box Elder
 Slippery Elm
 Sweet Gum

Bitternut Hickory
 Pignut Hickory
 Red Maple
 White Mulberry

Burr Oak
 Red Oak
 Willow Oak

Tulip Poplar
 American Sycamore
 Weeping Willow

Bushes
and
Shrubs:

Blackberry
Elderberry
Swamp Azalea
Spice Bush
Panicked Dogwood
Japanese Bamboo
Trumpet Creeper

High Bush Blueberry
Arrowwood (Viburnum)
Sweet Pepper Bush
Multiflora Rose
Silky Dogwood
Staghorn Sumac

Vines:

Bittersweet
Cathrier (Greenbrier)
Virginia Creeper
(Five Finger Ivy)
Fox Grape
Carrion Flower

Virgin's Bower
Dewberry
Ground Ivy
Poison Ivy
Groundnut
Japanese Honeysuckle

Meadow Grasses
and
Wildflowers:

Bush Clover
Yellow Clover
Timothy
Seabeach Dock

Red Clover
White Clover
Curled Dock
Mustard

Burdock
Jimsonweed
Common Milkweed
Morning Glory
Sorrel
Camphor Weed
Bedstraw
Wire Grass
Garlic
Virginia Thistle
English Plantain (Buckhorn)
Skunk Cabbage
Bellwort
Buttercup
Star of Bethlehem
Field Pansy (Johnny Jump Up)

Galinsoga
Lamb's Quarter
Spreading Dogbane
Smartweed
Corncockle
Chickweed
Coffee Grass
Purslane
Bull Thistle
Virginia Dayflower

Trout Lily
Dandelion
Celandine
Purple Violet

Blue-Eyed Grass
Panic Grass
Fool's Parsley
Common Daisy
Coltsfoot
Butter and Eggs

Yellow-Eyed Grass
Red Fescue
Orchard Grass
Goat's Beard
Mountain Mint
Jewelweed

Spatterdock
Marsh Mallow
Swamp Beggar Ticks

Pickelweed
Subulate Arrowhead

Cinnamon Fern

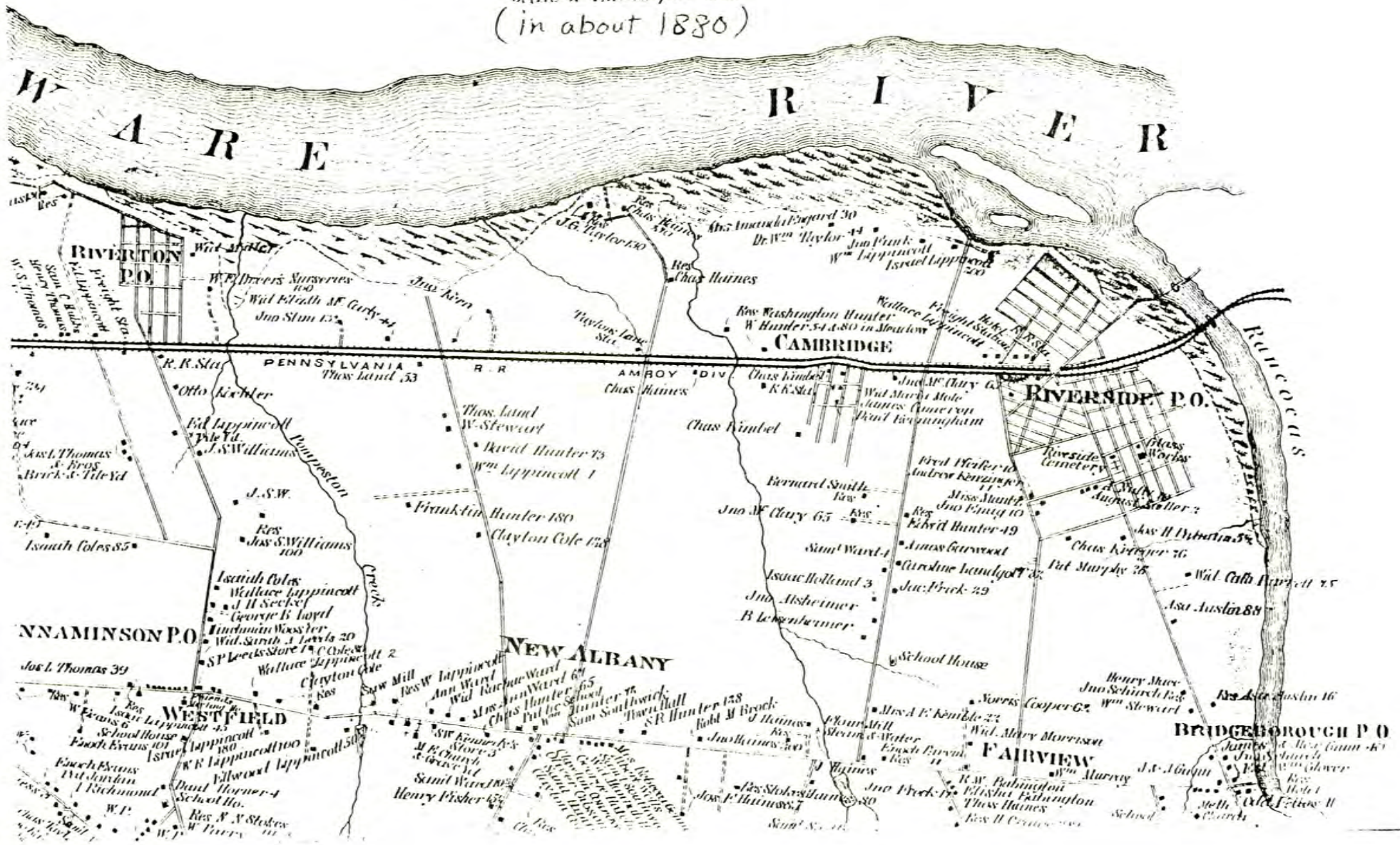
Sensitive Fern

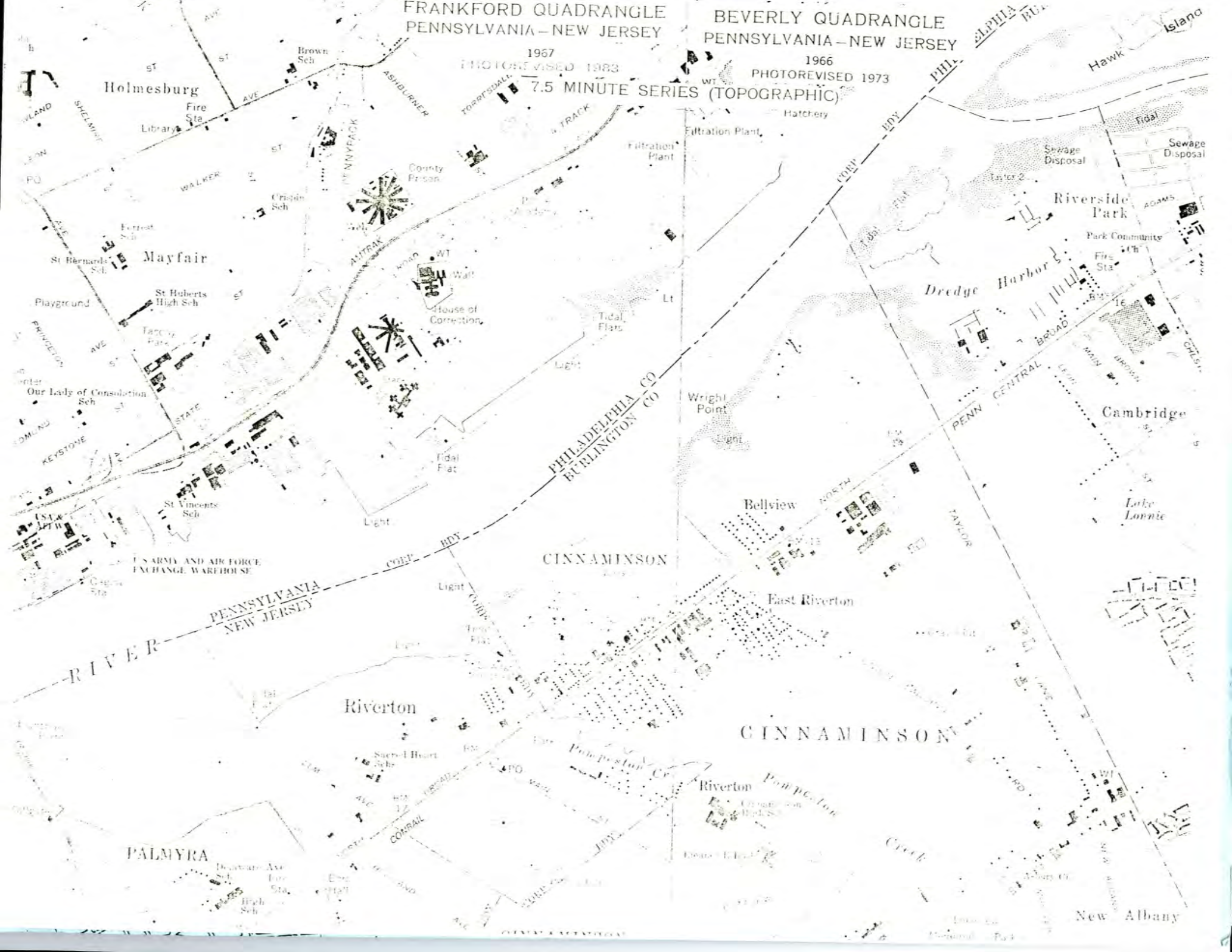
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CINNAMINSON

Scale 2 Inches per Mile
(in about 1880)





PHILADELPHIA-BURLINGTON
PENNSYLVANIA-NEW JERSEY

BEVERLY QUADRANGLE
PENNSYLVANIA-NEW JERSEY

1967
PHOTO REVISÉD 1983
7.5 MINUTE SERIES (TOPOGRAPHIC)

1966
PHOTO REVISÉD 1973

Holmesburg
Library
Fire Sta

Mayfair
St. Bernard's Sch
St. Huberts High Sch
Tasch Park

U.S. ARMY AND AIR FORCE
EXCHANGE WAREHOUSE

PALMYRA
High Sch

County Prison
Crispin Sch
Brown Sch

House of Correction
Walt

Riverton
Sacred Heart Sch

CINNAMINSON

Riverton

Filtration Plant

Wright Point Light

Bellview

East Riverton

Riverton

Sewage Disposal
Tidal
Sewage Disposal

Riverside Park
Park Community
Fire Sta

Cambridge

Lake Lonnie

CINNAMINSON

New Albany

ZONE MAP of Cinnaminson
(with additions)

PENNSYLVANIA

DELAWARE

RIVER

DREDGE POND

JR. SPAIN

IND.

RIVER SIDE HOMESTEAD FARM
IND. PRESERVE
and WILDLIFE

RIVERFRONT
IND. DEVELOPMENT
FORMER HIGH WATER LINE

HOEGANAES
HOEGANAES
RIPARIAN
LAND

STATE OF N.S.

WHITESELL
CONSTRUCTION

RIVER ROAD

HOEGANAES

IND.

WHITSELL
TAYLORS LANE

DOMESTON
CREEK

CINNA.
SEWERAGE
AUTHORITY
STATE OF N.S.
RIPARIAN

T.G. KELLY

STATE OF N.S.

PIPISCO
BOAT
WORKS

SLACK DRIVE

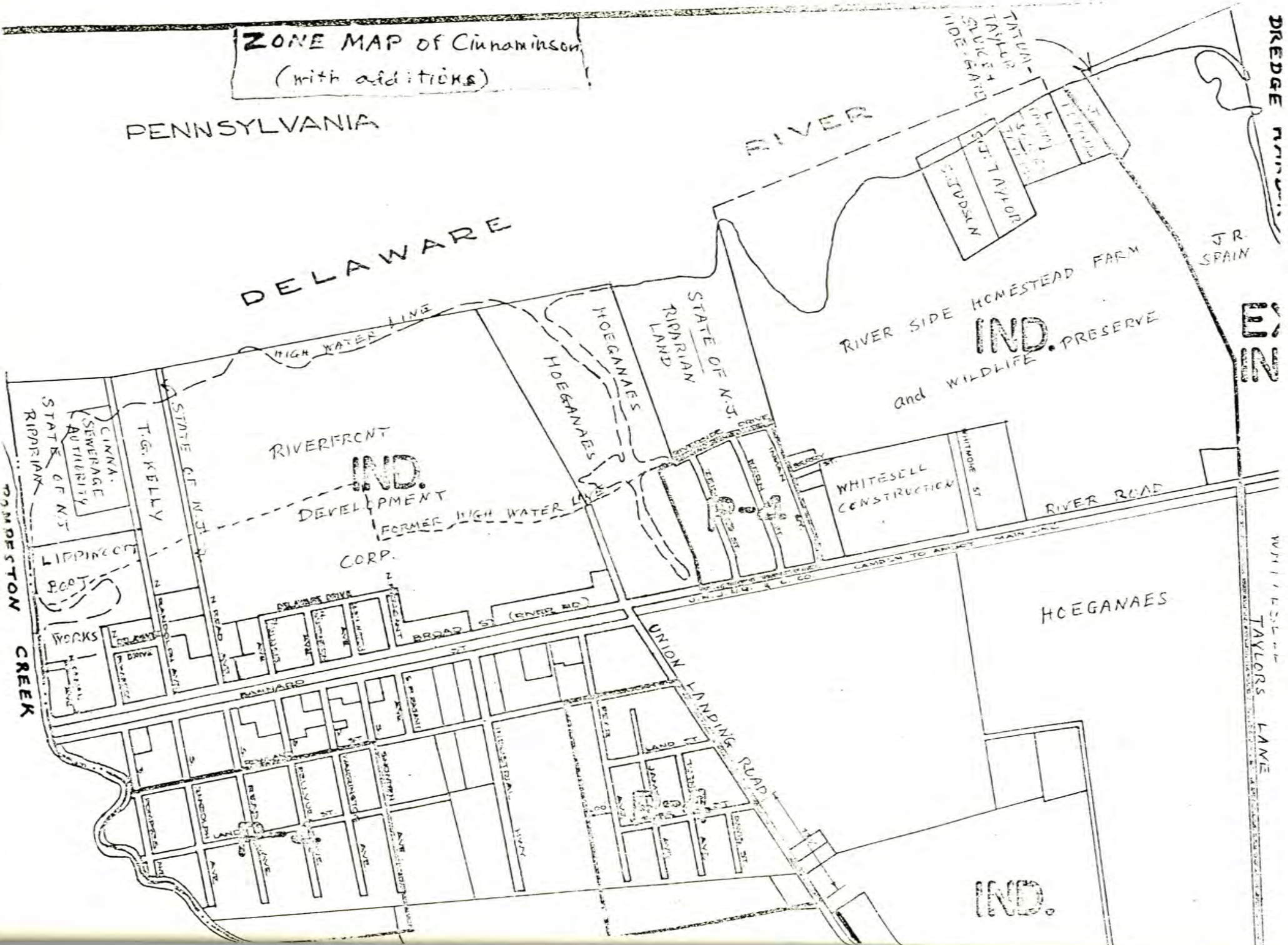
BROAD ST

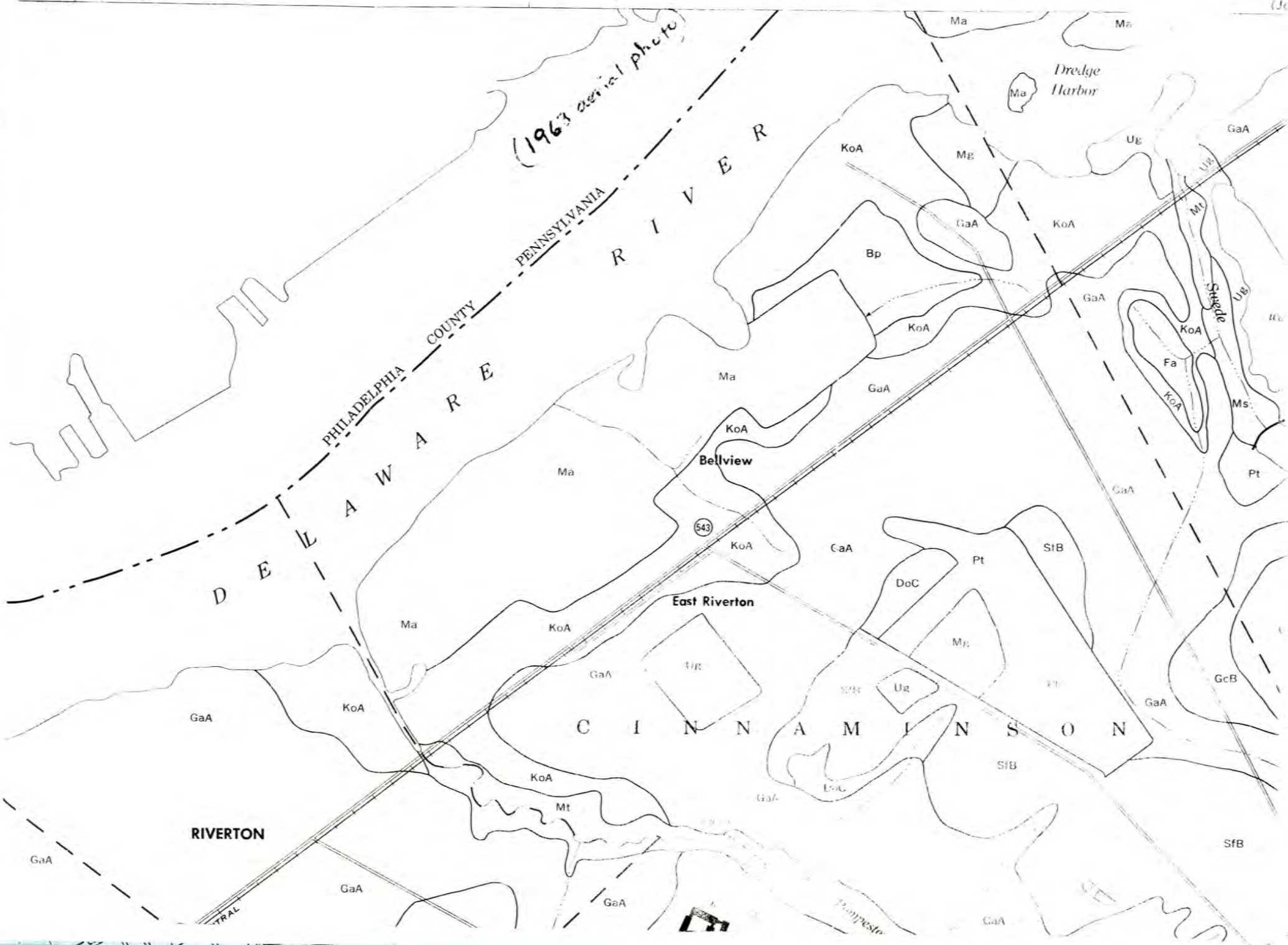
RANFORD

UNION LANDING ROAD

LANDING TO BRIDGE MAIN CHL

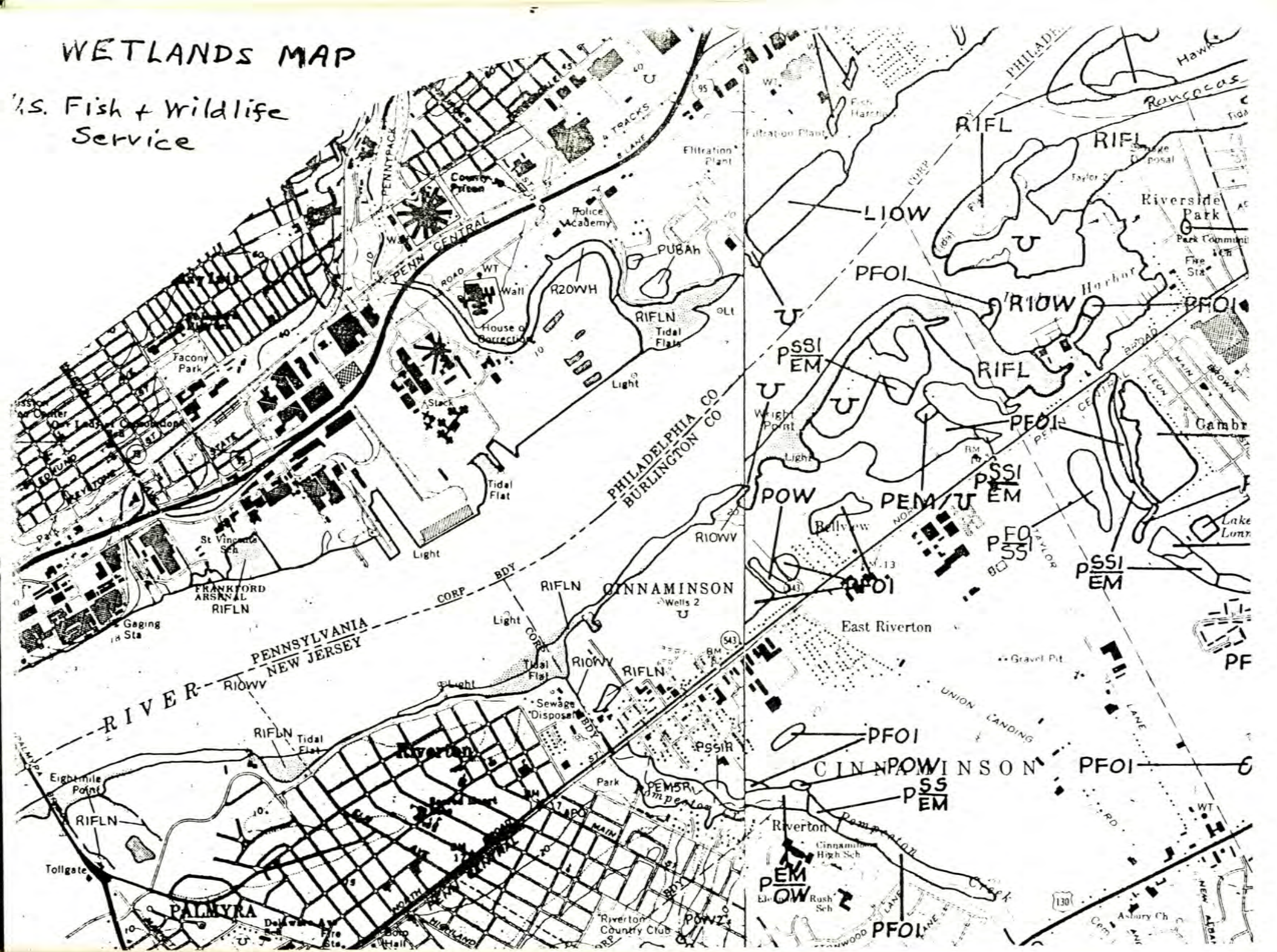
INTUN -
TAYLOR
LUDWIG
HIDE-A-WAY
ST. TAYLOR
STUDSON



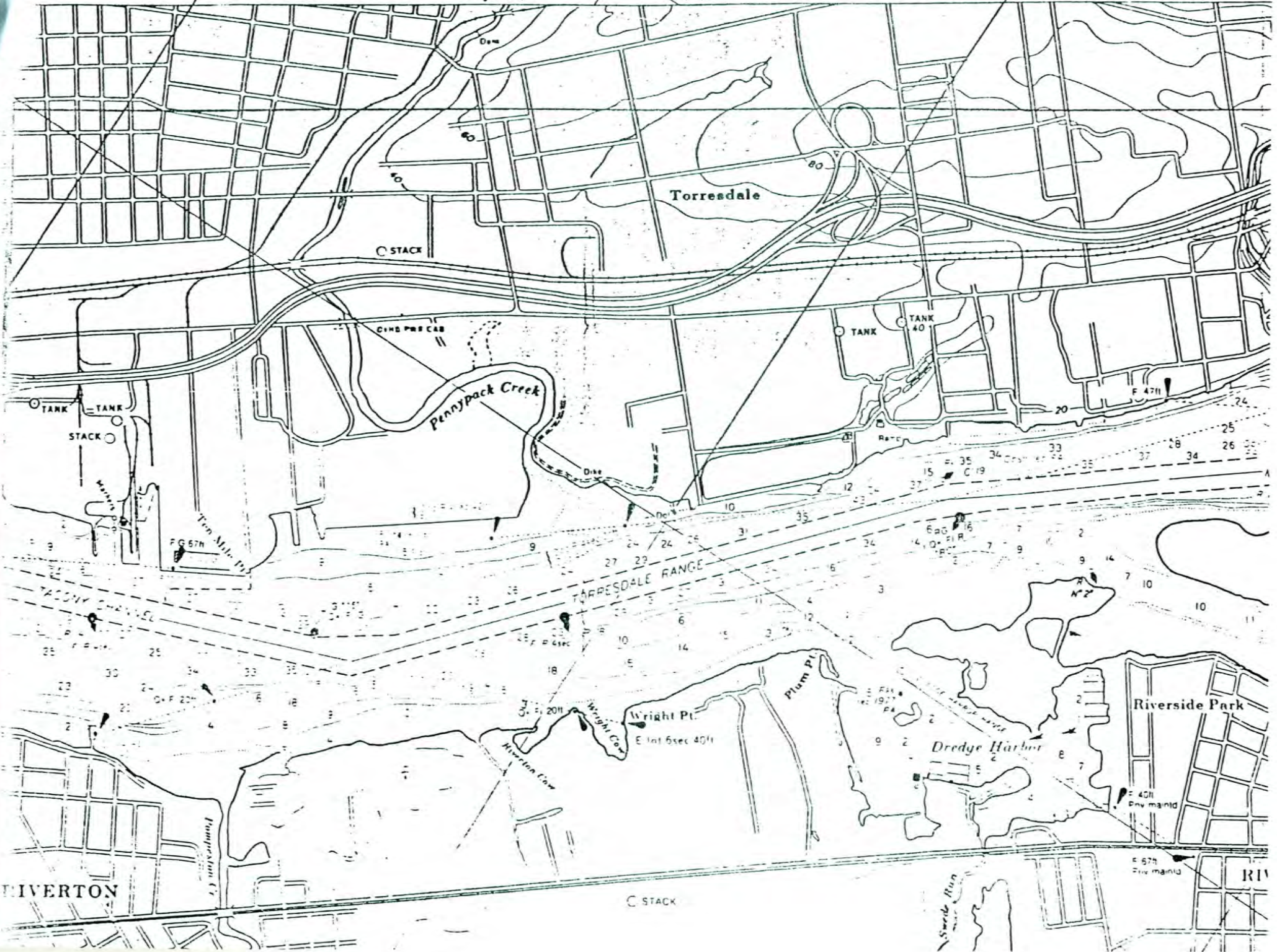


WETLANDS MAP

U.S. Fish + Wildlife Service



NAVIGATION CHART of the Delaware River



Torresdale

Pennypack Creek

TORRESDALE RANGE

Dredge Harbor

Riverside Park

DIVERTON

RIV

STACK

CIND PRR CAB

TANK

TANK 40

F 4711

STACK

FG 674

Wright Pt.

E Int 6sec 40ft

F 4011 Dry mauid

F 674 Dry mauid

STACK

Pennypack Cr

Sward Run

Plum Pt.