



MEMORANDUM

To: Jonathan Freedman, U. S. Army Corps of Engineers

From: Jim Kelley, Wetland Ecologist

cc: Elizabeth Leavitt, Port of Seattle

Date: May 3, 2000

Re: *Analysis of indirect impacts to wetlands from the temporary SR-509 interchange – Seattle-Tacoma International Airport*

This memorandum provides an overview of the SR-509 Temporary Interchange at South 176th Street, a description of current conditions at the site, and evaluates the potential impacts to adjacent wetlands that may result from the project. The interchange project involves no discharge of fill material into waters of the United States including wetlands. Furthermore, we have analyzed potential indirect impacts to wetlands and concluded that no significant indirect impacts to wetlands will occur. The interchange is also constructed on existing road fill and other disturbed areas that do not act as buffers to protect the functions of adjacent wetlands.

PROJECT OVERVIEW

To provide construction vehicles direct access from SR-509 to the west side of Seattle-Tacoma International Airport (STIA), a temporary interchange would be constructed near the existing South 176th Street overpass. The half-diamond interchange would consist of an exit ramp from southbound SR-509 to South 176th Street and an entrance ramp from 176th Street to northbound SR-509.

The Port will use the interchange as part of its fill haul route during construction of the third runway, as described in the 1996 Final Environmental Impact Statement (EIS) and 1997 Final Supplemental EIS prepared pursuant to the National and State Environmental Policy Acts (see Federal Aviation Administration Record of Decision dated July 3, 1997 for a discussion of the EISs). This facility will be dedicated to haul vehicles for the third runway construction at STIA and will be removed upon completion of the third runway construction. The Port will be responsible for operation and maintenance of temporary and permanent drainage features throughout construction of the third runway project as stated in the Temporary Interchange Design, Construction and Operation Agreement.

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As explained in the following sections, the temporary interchange was designed to avoid any direct fill impacts to wetlands. The interchange will be largely constructed on existing SR-509 road fill. Where necessary, short (less than 30 ft high) retaining walls are used to assure the project can be constructed on the existing road. Stormwater detention facilities, water quality treatment facilities, construction methods, and construction monitoring procedures have been developed to assure that impacts to the wetlands do not occur.

SITE CONDITIONS

Proximity to wetlands

Portions of the temporary interchange are located between Wetland 43 and Wetland 44. Wetland 44 is located generally east of and Wetland 43 is generally west of SR-509 and the project.

Construction of the southbound exit ramp will be between the existing SR-509 and the delineated edge of Wetland 43. Construction will occur more than 55 feet from the wetland edge. The land between the wetland and SR-509 consists of the SR-509 fill prism, including a gravel maintenance road. The area is vegetated with grass, invasive shrubs (Scots broom and Himalayan blackberry), and red alder saplings. This vegetation is periodically mowed and does not serve to protect the wetland from ongoing and adjacent disturbances.

Construction of the northbound entrance ramp of the temporary interchange generally occurs greater than 50 feet from the edge of Wetland 44. The ramp lies 20 to 50 feet from the wetland for about 100 linear feet near its start at South 176th Street. The ramp is 12 to 50 feet from the wetland edge for about 200 linear feet near its mid-point. The land between the wetland and SR-509 consists of the SR-509 fill prism and fill placed on Parcels 494, 496, 497, and 498. The area is vegetated with grass and invasive shrubs (Scots broom and Himalayan blackberry). This vegetation is periodically mowed and does not serve to protect the wetland from ongoing and adjacent disturbances.

Both Wetlands 43 and 44 lie within the Walker Miller Creek Watershed. Walker Creek begins at the western edge of Wetland 43. Adjacent land use consists of single-family housing and SR-509 (which bisects the originally contiguous wetland). Wetland 44 is forested and Wetland 43 has forested, shrub, emergent and open-water components.

Historical aerial photos from 1961 (attached) show the wetland areas (prior to construction of SR-509) were once contiguous, largely farmland, with a drainage ditch crossing the area. In 1978 the wetlands were bisected by the construction of SR-509, and the hydrologic connection between the wetlands maintained via a 36-inch diameter culvert installed under the roadway.

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Previous Earthwork

SR-509 from milepost 22.98 to milepost 24.11 including the South 176th Street bridge, was constructed in 1978. Generally, the section of road north of the South 176th Street bridge is predominantly fill. Approximately 200 feet north of the South 176th Street bridge SR-509, is constructed in a cut, which continues south of the bridge on both sides of SR-509. A portion of the northbound temporary interchange will cross Parcels 496, 497, and 498. The steep slope along the north and western edges of these parcels suggests that they are also fill materials. These parcels once contained a residence and a metal outbuilding, which have recently been demolished.

The majority of the southbound portion of the temporary interchange will also be constructed on the existing SR-509 fill trapezoid. However, as the temporary interchange approaches South 176 Street through the SR-509 right-of-way it will cross disturbed native soil (greater than 100 feet from the wetland edge). The northbound portion of the temporary interchange will be constructed on the existing SR-509 fill within the right-of-way trapezoid and on the existing fill of Parcels 496, 497, and 498.

Existing Drainage Features

Existing drainage facilities associated with SR-509 are described in the *Hydrologic Report- SeaTac International Airport Third Runway Direct Access* (HNTB 2000) (See Attached).

The existing drainage in the vicinity of the SR-509/South 176th Street bridge is composed of two primary systems, a groundwater collection system and a storm water runoff collection system.

The groundwater collection system for SR-509 is located in the vicinity south of the South 176th Street bridge. This system, which consists of perforated pipes within the roadway sub-grade, collects the groundwater surfacing in the SR-509 cut section. The collection system conveys collected water to drain lines near the east and west edge of SR-509. The drain line on the eastside crosses SR-509 just north of the South 176th Street overpass to connect with the drain line on the west side. The combined flow is conveyed down the west edge of the highway, bypassing the stormwater detention system at the base of the SR-509 embankment. The flow is then discharged to Wetland 43.

Three storm drain sub-basins collect the runoff from SR-509, the bridge, and their vicinity. The total collection area is approximately 45 acres, including approximately 8 acres of impervious surface (primarily SR-509 and South 176th Street) and 37 acres of pervious wetland and residential land uses. Detention and water quality facilities intended to treat this runoff are generally undersized when compared to the standards used to design the temporary interchange.

The south sub-basin is approximately 12.6 acres; it collects the roadway runoff from the southern end of SR-509 to just north of the South 176th Street overpass. Runoff from the northbound roadway is collected at the median barrier in catch basins and conveyed to an enclosed drainage system at the west edge of the pavement. The runoff from the

southbound roadway is collected in a roadside ditch and combined with the runoff from the northbound roadway in the storm sewer.

The middle sub-basin is approximately 20.7 acres and extends approximately 1,150 feet north of the South 176th Street overpass. Roadway runoff is collected in roadside catch basins that outlet to the ditch and wetland east of SR-509. The wetland east of SR-509 drains to the stormwater facility on the west side of SR-509 through a 36-inch diameter culvert crossing.

The north sub-basin is approximately 11.7 acres and extends approximately 1,300 feet south from South 168th Street. The runoff from this sub-basin is collected at the roadside gutter in catch basins and conveyed to a ditch (on the east side of SR-509) that crosses to a stormwater detention pond on the west side of SR-509 through a 24-inch diameter culvert.

PROJECT DESIGN

The temporary interchange has been designed to avoid significant hydrologic and water quality impacts to wetlands or Walker Creek. Hydrologic designs and their potential impacts are discussed in the following sections.

New Groundwater Management

Drainage for the structural earth walls of the interchange will be the only new subsurface drainage systems for this project. These will consist of "weep-holes" (see WL-1 and WL-2 in the Attached Plan Sheets) that will allow the small amounts of water that may infiltrate the fill to seep from behind the wall to the surface.

The existing subsurface drainage conveyance system serving SR-509 in the vicinity of the South 176th Street bridge will be modified (by adding a bypass pipe segment [see Sheet D1]) to avoid damage to the system from construction of the proposed southbound off-ramp. This modification will not alter the flow volume or timing of groundwater flow that eventually discharges to Wetland 43.

New Stormwater Management Facilities

The stormwater drainage system has been designed to capture runoff from the new impervious surface area and to detain accumulated runoff consistent with King County Level 2 requirements. The stormwater system will capture and detain runoff from an additional 40 percent of the existing road surface consistent with the *Stormwater Effects Guidance* provided by WSDOT and National Marine Fisheries Service (NMFS) for salmon listed under the Endangered Species Act (ESA). All collected runoff will be treated to improve water quality prior to discharge into the existing WSDOT pond system and outfall.

The drainage design was completed using the King County Surface Water Design Manual (1998 edition). Runoff volumes were modeled using the King County Runoff Time Series (KCRTS) model, but for comparison, the project was also analyzed using the

Santa Barbara Unit Hydrograph method (using “WaterWorks” software). The results showed that the KCRTS model offers a more conservative design, providing facilities that are more protective of downstream wetlands and creeks. The detention pond sizing and release rates meet Level 2 Flow Control requirements.

The temporary interchange will add approximately 1.66 acres of impervious surface and reduce the pervious surface in the vicinity by the same area. The system will also collect runoff from an additional 40 percent (0.67 acre) of the existing roadway’s impervious surface to meet requirements of the NMFS retrofit agreement. A total of 2.47 acres would flow to the new detention and water quality facilities. The areas draining to the new detention pond would account for approximately 26 percent of the total impervious surface in the three sub-basins (calculated after the interchange construction).

An existing roadside drainage ditch would be modified to develop the water quality treatment facilities required for the project. This existing ditch drains to an existing stormwater pond outfall (at Station 932+00), that will be redeveloped as a wet biofiltration swale. The outlet pipe from new ponds will discharge into the wet biofiltration swale at approximately Station 929+00, storm water will flow north to the swale, with treated water exiting into the discharge channel from the existing pond. The wet biofiltration swale will be designed and constructed to meet the King County Surface Water Design Manual standards.

The detention facility for the project is designed to comply with King County Level 2 Flow Control, which requires the developed discharge durations to match 50 percent of the pre-developed 2-year to the full 50-year peak flow. The 50 percent release rate is intended to minimize the erosive effects of runoff on creeks and streams (for this project, a large area of Wetland 43 will be provided with additional protection above the Level 2 standard). The specified release rates (see below) will be achieved using an outlet control structure with multiple orifices that allows staged discharge from the detention pond. For all storm events, the post-project peak flow rate will be below the existing peak flow rates.

Storm Event	Peak Flow (cfs)	
	Existing	Proposed
2-year	0.189	0.092
10-year	0.232	0.190
25-year	0.238	0.225
50-year	0.345	0.230
100-year	0.398	0.232

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The Hydraulic Report for this project has been reviewed and approved by the WSDOT Olympia Service Center Hydraulics Office, as well as the WSDOT Northwest Region Hydraulics Office. In addition, comments concerning detention and treatment from an independent reviewer were received and addressed. The comments raised by the independent reviewer were researched, and an independent evaluation by King County

has indicated that the design meets the current detention and treatment requirements. The stormwater conveyance system was analyzed using current WSDOT methods and is also compliant.

The hydraulic design also meets the requirements for “No Effects” prescribed under the WSDOT stormwater guidance concerning ESA agreed upon by NFMS.

The stormwater detention pond and biofiltration facilities will remain in place following demolition of the temporary interchange; thus, the benefits derived from the stormwater facilities will be permanent.

Construction stormwater, sediment, and erosion control

A Stormwater Pollution Prevention Plan (SWPPP) details stormwater management for the SR-509 interchange during construction and operation (See Attached). These plans identify the BMPs necessary to protect adjacent wetlands and surface water from potential water quality impacts during construction.

The BMPs—combined with the small size of the project, construction timing, and other site conditions—provide a high level of protection to adjacent sensitive areas. Construction of the project will result in a small, linear disturbance footprint, from which stormwater can readily be collected and conveyed to treatment facilities. The linear configuration reduces the likelihood that, even if BMPs failed, significant amounts of stormwater could concentrate and cause significant damage.

A proactive monitoring plan will be implemented to assure that all planned BMPs are properly implemented and maintained. Monitoring of the BMPs during storms will verify that they are effective and help identify maintenance needs to prevent potential failures. Monitoring of BMPs includes the following actions:

- Inspection during and following construction to assure that they are constructed properly,
- Inspecting each BMP following 0.5 inch of rain to determine whether any maintenance is required.
- Monitoring discharge and receiving waters to verify that permit conditions are met and that BMPs are effective,
- Use of advanced treatment methods as a contingency treatment method if monitoring demonstrates this need.

The SR-509 interchange includes the following features to assure the project can be constructed to meet water quality standards and protect adjacent wetlands:

- Protect wetland and buffers with installation of 2 layers of silt fence,

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- Minimize disturbance of vegetation and soil when installing and maintaining sediment and erosion control measures,
- Treat unworked areas with erosion control cover measures according to the *King County Surface Water Design Manual*,
- Apply water to the site as necessary to control dust,
- Limit clearing and grubbing to areas that will be worked within the next 7 days,
- The contractor shall construct a temporary sedimentation pond at the site of the new stormwater detention pond at the north end of the project on the east side of the embankment prior to other land-disturbing activities (See D-1 through D-3 and details on DD-1 in Attached Plan Sheets),
- The contractor shall operate the two existing ponds on the west side of SR-509 and the new pond as sedimentation ponds. Runoff shall be diverted to the ponds (See D-3 and details on ST-1 in Attached Plan Sheets),
- The contractor shall install catch basin inserts into all existing storm drains and into all storm drains (as they are made operational).

POTENTIAL FOR DIRECT AND INDIRECT IMPACTS TO WETLANDS 43 AND 44

Ecological Conditions

No Direct or indirect impacts to water quality conditions. Based on the stormwater management facilities and BMPs described above, the temporary interchange project will not degrade water quality conditions in the wetlands. Stormwater management facilities meet King County Stormwater Manual standards and WSDOT/NMFS treatment and retrofit guidelines for “no effect.” Following demolition of the interchange, stormwater quality facilities that treat stormwater which is currently untreated, will remain. This will result in a net long-term benefit to water quality conditions in the wetland.

No Direct or indirect impacts to water quantity

Based on the stormwater management facilities and BMPs described above, the temporary interchange project will not significantly alter runoff rates that could impact downslope wetland or stream habitat. Stormwater management facilities meet King County stormwater requirements. The new detention facilities result in no significant delay in stormwater runoff reaching the wetlands because Level 2 control matches past project runoff to pre-project conditions. This effect is beneficial overall in that it potentially moderates water level fluctuations that can be detrimental to some aquatic species. The separation of the existing groundwater collection system from stormwater management systems will prevent any changes to the water quantity (volume and timing) of groundwater flow that currently reaches Wetland 43.

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Ecological Functions

Five biological functions were examined. These functions determine the degree to which the wetlands: (1) support resident and anadromous fish, (2) provide songbird habitat, (3) provide waterfowl habitat, (4) provide amphibian habitat, and (5) provide small mammal habitat. Four physical functions provided by wetlands were also examined. These functions examined the wetlands' ability to: (1) export organic matter to downslope systems, (2) maintain groundwater exchange, (3) provide flood storage, and (4) enhance nutrient retention and sediment trapping.

Based on evaluations of the physical and biological indicators of wetland function observed in each wetland, professional judgement, and knowledge of other wetland ecosystems in the Puget Sound region (urban and non-urban), the functional performance of these wetlands was evaluated. Functional performance ratings were assigned as follows:

High- The wetland contains several important characteristics required to perform the function, and lacks indicators that prohibit the function from occurring in the wetland.

Moderate- The wetland contains one or more characteristics required to perform the function; however, several of these may be secondary indicators. The wetland may contain one or more characteristics that interfere with or prevent optimal performance of the function in question.

Low- The wetland lacks significant indicators that the wetland could perform the function in question. One or more indicators that the wetland does not perform the function are typically present.

Supports resident and anadromous fish.

Wetland 43 rates as moderate for this function because the wetland has persistent open water that is connected to Walker Creek, it is likely that this wetland directly supports resident fish. Walker Creek provides habitat for coho salmon downstream of Wetland 43. ESA listed fish species are not reported in the creek or Wetlands 43 and 44. The creek and wetlands do not provide habitat for listed species due to the small size of the creek, hydrologic conditions in the wetlands, and lack of suitable habitat features. There are no historical records indicating listed species once used these habitats. No salmonid or resident fish use is likely in Wetland 44, and it is rated low for this function. Wetland 44 has a seasonal hydrologic connection to Wetland 43 via a 36-inch diameter culvert under SR-509, but it does not contain significant fish habitat due to the lack of persistent surface water at sufficient depth. Both wetlands indirectly support fish by providing hydrologic functions, as described below.

Direct impacts to fish habitat will not occur during the construction and operation of the temporary interchange because no stream channel, fish habitat, or riparian area will be modified. The 36-inch diameter culvert connection between each wetland will remain

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and will not be altered. No vegetation that provides shade or organic matter input to streams will be removed.

Indirect impacts to fish habitat will not occur during the construction or operation of the temporary interchange, as explained in sections addressing project design, stormwater management, and wetland protection strategies

Provides habitat for song (passerine) birds

Wetlands 43 and 44 provide moderate to high habitat for songbirds. The vegetation of both wetlands provides multi-layered structure, standing dead snags, and abundant sources of food for various songbird guilds. Because Wetland 43 is larger, contains a greater number of habitat types, and contains areas more isolated from areas of human use, it provides higher quality habitat than Wetland 44. However, the location of these wetlands within an urban environment and in relation to SR-509 results in human disturbance that limits the types of species that may use the wetlands as habitat. Species using the wetland are typically tolerant of human disturbance.

No direct impacts will affect the wetlands' ability to provide habitat for songbirds during the construction and operation of the temporary interchange, because no habitat characteristics of the wetland will be changed by the project.

Increased noise from the construction and operation of the temporary interchange will not result in significant indirect impacts to passerine birds because the resident or transient bird populations that use the wetland are adapted to the high levels of noise and human disturbance that are currently present in the area. For example, the wetland adjacent to the entire project already lies near SR-509, South 176th Street, or other developed property that generate human disturbance and noise impacts. The vegetated slopes of the existing SR-509 road bed (the construction site for most of the project) are maintained as highway right-of-way through mowing and periodic clearing of woody vegetation. The portions of several parcels subject to construction are largely clear of woody vegetation as a result of former residential land uses. As a result, constructions near the wetland will neither remove any significant habitat for passerine birds nor remove any vegetation barrier that would screen the wetlands from adjacent disturbances.

Provides waterfowl habitat

Wetland 43 rates as moderate to high and Wetland 44 rates as low for this function. Wetland 43 has persistent open water and emergent vegetation that provide habitat for a variety of nesting and foraging waterfowl species. Wetland 44 does not contain open water or suitable habitat for nesting, foraging, or migrating waterfowl. Neither wetland provides suitable nesting (critical habitat) or foraging habitat for marbled murrelets. Bald eagles have not been observed in Wetland 44, but they could potentially prey upon waterfowl that use the wetland.

No indirect impacts to the characteristics of the wetland that provide waterfowl habitat functions will occur from construction or operation of the temporary interchange. Significant waterfowl habitat is not present in Wetland 44. In Wetland 43, waterfowl

habitat is located over 800 feet from the project site and is densely screened from the project by forested vegetation. Thus, the project is unlikely to significantly affect levels of human disturbance in this wetland.

Provides amphibian habitat

Wetland 43 rates as moderate to high for this function, while Wetland 44 rates as low for this function. Wetland 44 contains significant open water, emergent vegetation, and downed woody debris that are key habitat features for amphibians. Wetland 44 lacks these features. Amphibian habitat adjacent to both wetlands is poor due to a variety of land-uses. In addition, the wetlands are isolated from other suitable breeding habitat that further limits the habitat value of the wetlands for amphibians.

Because interchange construction and operation will not alter wetland vegetation or hydrology, no direct impacts to amphibian habitat will occur. The project will not remove forested areas potentially used by adult amphibians, nor will it create any migration barrier between breeding habitat in the wetland and suitable terrestrial habitat elsewhere in the watershed. As explained elsewhere, Level 2 storm water management and water quality treatment facilities will prevent increased water level fluctuations or water quality impacts that could affect amphibian populations. Indirect impacts to amphibians through increased noise are unlikely.

Provides small mammal habitat¹

Wetland 43 and Wetland 44 are rated moderate to high for this function. The vegetation in the wetlands provides heterogeneity, standing dead snags, and offers good cover and food for small mammals. Both wetlands are adjacent to SR-509 and residential development, noise and other human disturbances are prevalent in each wetland. This condition has also eliminated and fragmented habitats in adjacent upland areas, such that use of the wetlands by small mammals is limited to those tolerant of human activity.

Small mammals that are expected to use the wetlands include raccoon, opossum, coyote, mice, rats, and squirrels. Beavers inhabit portions of Wetland 43.

Significant indirect impacts, including human disturbance, to the wetlands' small mammal habitat functions will not occur. For example, while construction activities will occur near the wetland, the wetland adjacent to the entire project is already bisected by SR-509 and is near South 176th Street or other developed property. This results in ongoing human disturbance and noise. The vegetated slopes of the existing SR-509 roadway (the construction site for most of the project) are maintained as highway right-of-way through mowing and periodic clearing of woody vegetation. Portions of several parcels that are part of construction are clear of woody vegetation due to past residential landuses. As a result, construction near the wetland will neither remove any significant habitat for small mammals nor remove any vegetation barrier that may screen the

¹ The wetlands do not provide significant habitat for large mammals because they are too small to independently support the habitat requirements of large mammals found in western Washington. Large mammals cannot use the wetlands because adjacent development and habitat fragmentation prevents access.

wetlands from human disturbance. The project will not create any new barriers that would significantly alter movements of small mammals between the wetlands and other areas of suitable habitat because the existing SR-509 roadway is already a significant barrier to wildlife movement.

Exports organic matter

Both Wetlands 43 and 44 rate as high for the export of organic matter to downslope aquatic systems (i.e., Walker and Miller creeks). This function is enhanced by seasonal (Wetland 44) and perennial (Wetland 43) channelized flow, presence of open water, and a deciduous forest overstory.

Direct or indirect impacts to this function will not occur during the construction and operation of the temporary interchange because the stream channels, hydrologic conditions, or riparian area will not be modified. The 36-inch diameter culvert connection between each wetland will remain and will not be altered. No vegetation that provides organic matter input to streams will be removed.

Maintains groundwater exchange

Both Wetlands 43 and 44 rate as high for this function. Each wetland is predominately an area of groundwater discharge, as evidenced by springs and seepage areas in several locations.

No direct or indirect impacts will interfere with the wetland's ability to maintain groundwater exchange during the construction and operation of the temporary interchange. Existing groundwater collection facilities located beneath SR-509 will be maintained during construction and operation. They will remain isolated from new and existing stormwater conveyance systems, so that no change in the rate or quality of groundwater entering the wetland will occur. Existing road fill upon which the project will be built does not provide groundwater discharge functions because the fill is elevated above the ground surface and thus isolated from groundwater tables. The SR-509 pavement surface prevents infiltration of rainwater into the fill, so there is no source of water to discharge from the fill. Drainage for the structural earth walls will contain subsurface drainage systems that allow the small amount of groundwater that could otherwise collect behind them to discharge to the wetland. Infiltration through stormwater detention facilities will likely replace the small reductions in infiltration through the existing fill due to new impervious surfaces².

Provides flood-storage and runoff de-synchronization

Wetland 43 rates as high and Wetland 44 rates as low to moderate for this function. Wetland 44 is a slope and offers hydrologic roughness that slows and temporarily detains stormwater. Wetland 43 is a large depression that detains floodwater and moderates peak flows in Walker Creek, which has its source in this wetland.

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² Infiltration into fill immediately adjacent to the wetland would not affect creek base flows because the time of travel between the point of infiltration and downslope discharge site 10 – 50 feet away would be very short. Therefore, the effect of reduced infiltration due to new pavement would not be significant.

No direct or indirect impacts will occur to these wetlands' ability to provide flood-storage and moderate peak flows during the construction and operation of the temporary interchange, because no physical modification to the wetland will occur. Wetland area, existing hydrologic connections, wetland topography, and wetland vegetation will not be altered by the project.

Enhances nutrient retention and sediment trapping

Wetland 43 rates as high and Wetland 44 rates as moderate for this function. Wetland 44 is a slope with channelized flow that exits the wetland through a 36-inch diameter culvert at SR-509. The wetland may act as a sink for sediment that enters the perimeter of the wetland. However, due to the high gradient and eroded channel in the base of the ravine, it is also likely to be a source of sediment to Wetland 43. The large area, dispersed channels, low-flow velocities, and dense vegetation in Wetland 43 create nearly optimal conditions for nutrient retention and sediment trapping. The open water in Wetland 43 would be subject to high solar radiation during the summer months and would contribute to high stream temperatures in the upper portion of Walker Creek.

No direct or indirect impacts will interfere with the wetland's ability to retain nutrients and trap sediments during the construction and operation of the temporary interchange. Wetland area, existing hydrologic connections, and wetland vegetation will not be impacted during the project.

Buffer Functions

As explained above, the temporary interchange project will not result in significant indirect impacts to the functions provided by Wetlands 43 and 44. The modification to the wetland buffer through development of the interchange will not alter characteristics of the wetland that are critical to providing the various functions analyzed above. Neither will the modifications alter the protective functions that a buffer could provide (i.e., screening of the wetland from human activities or protection of water quality), because significant woody vegetation is removed through periodic maintenance and because stormwater is not conveyed to the buffer for treatment. Therefore, it is apparent that the areas modified for the interchange do not provide significant protective functions as a wetland buffer. Their ability to function as wetland buffer has been eliminated by past filling and their existing land uses (i.e., as highway, street, and residential areas) that result in periodic mowing and elimination of most native vegetation.

CONCLUSION

The proposed interchange project involves no discharge of fill material to waters of the United States. Further, the proposed interchange project has been exhaustively evaluated for potential direct and indirect impacts to the condition and ecological functions provided by the wetlands. Based on the project design and analysis presented above, no direct impacts and no significant indirect impacts to the wetland will occur.

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Attachments:

Plan Set

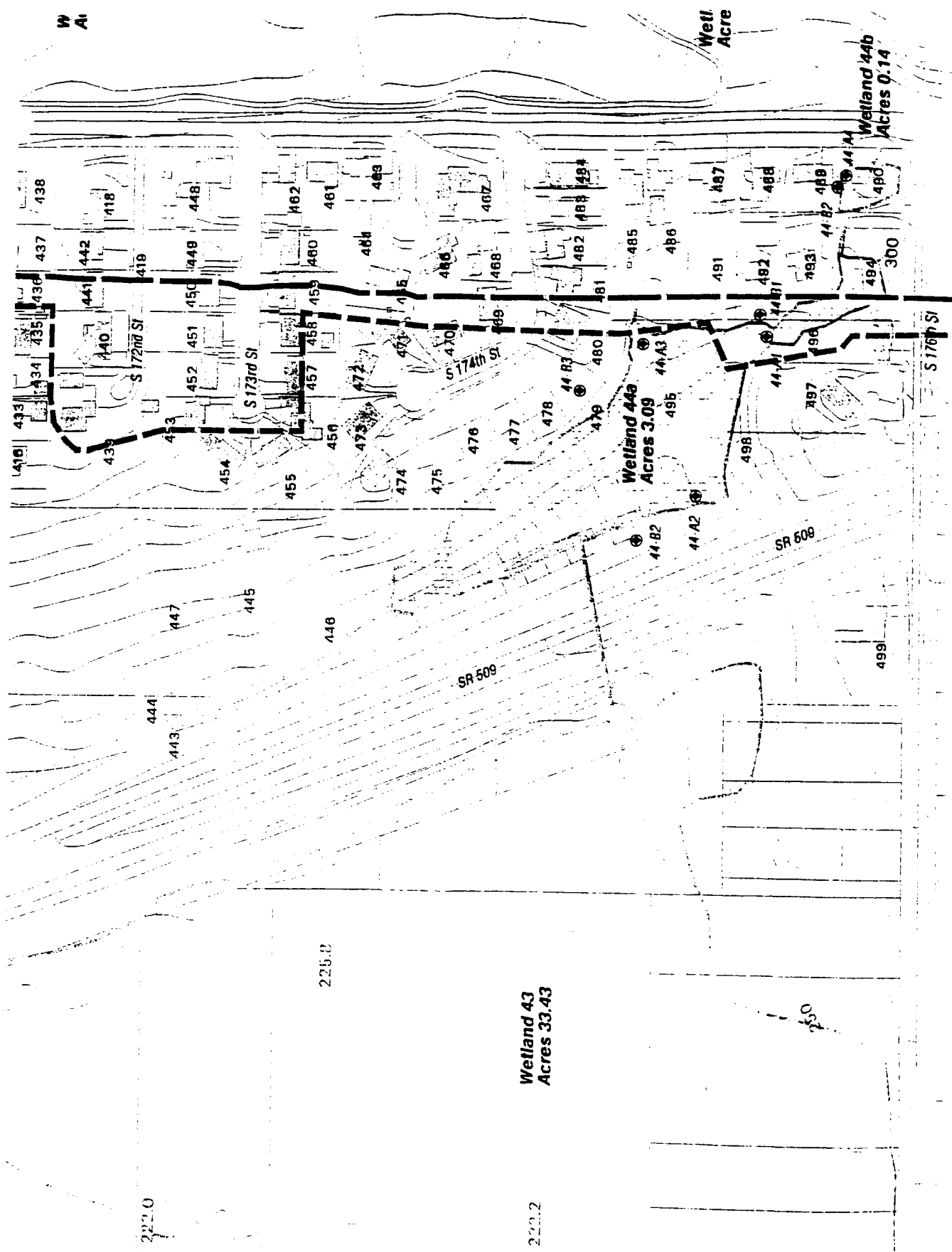
Hydraulic Report

1961 and 1995 aerial photographs

Wetland delineation map

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Wetl.
Acre

Wetland 44b
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Wetland 44a
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Wetland 43
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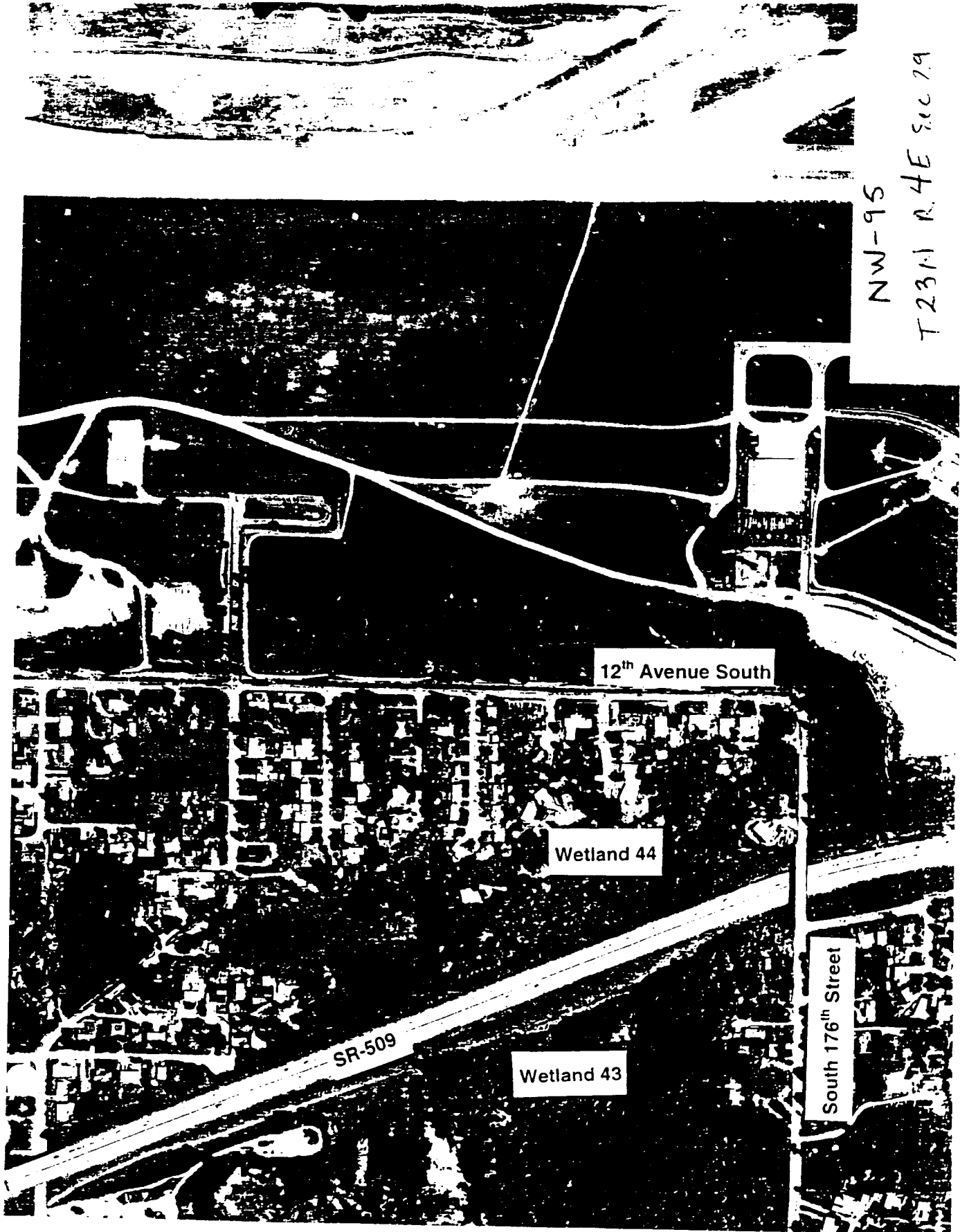
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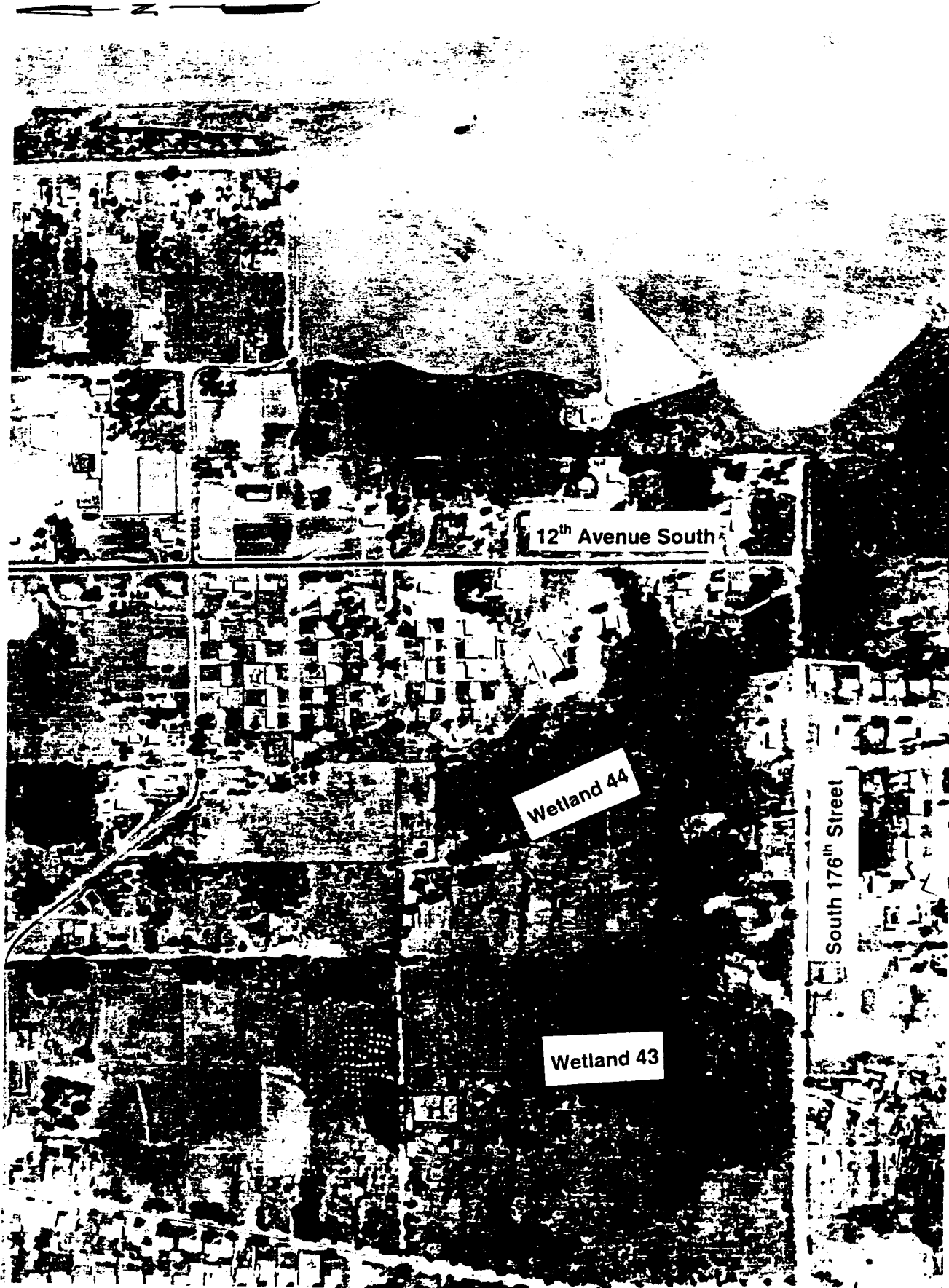
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