

**CHAPTER 9**  
**ENVIRONMENTAL EVALUATION**

## **CHAPTER 9**

### **ENVIRONMENTAL EVALUATION**

This chapter assesses the environmental impacts of proposed wastewater treatment system improvements for the City of Lebanon. The assessment considers impacts on both the natural and the human environment. The specific environmental factors considered in the following evaluation include: wetlands, floodplains, agricultural lands, wild and scenic rivers, fish and wildlife, threatened and endangered species, and historic or cultural resources. The chapter also summarizes the City's public involvement efforts associated with the development of the facilities plan.

#### **ALTERNATIVE STRATEGIES**

There are essentially three alternative strategies for upgrading the wastewater treatment facilities for the City of Lebanon:

1. No Action Alternative.
2. Runner-Up Alternative. Upgrade the existing wastewater treatment facility in an environmentally sound manner so that the City can pursue an effluent reuse program. This alternative was the recommended strategy in a draft version of the facilities plan that was completed in December 2000.
3. Preferred Alternative. Upgrade the existing wastewater treatment facility in an environmentally sound manner so that the City can pursue a program for rapid infiltration and subsurface discharge to the South Santiam River.

By choosing the no action alternative, the City of Lebanon would be in violation of the established Mutual Agreement and Order (MAO) and would eventually violate additional requirements in its National Pollutant Discharge Elimination System (NPDES) permit due to the continuing growth of the community. To avoid growth related violations, the City would eventually have to declare a prohibition on new connections to the system. The requirements established in the MAO and the NPDES permit are intended to protect water quality in the receiving stream. By not implementing facility improvements, water quality degradation due to toxicity and eventually excess loading would impair the fish and wildlife habitat provided by the South Santiam River. Since these outcomes are not acceptable, the no action alternative is eliminated from further consideration.

Upgrading the existing facilities in an environmentally sound manner is the necessary approach and could be satisfied by either the runner-up alternative or the preferred alternative. As discussed in Chapter 7, the preferred alternative is to pursue a program for rapid infiltration and subsurface discharge to the river. A feasible runner-up alternative is to pursue a program for effluent reuse. These feasible alternatives are considered in the following assessment of environmental impacts.

## **AFFECTED ENVIRONMENT/ENVIRONMENTAL CONSEQUENCES**

The majority of the proposed wastewater treatment system improvements are planned for implementation within the boundaries of the existing wastewater treatment plant site with the exception of the effluent discharge system improvements. For the runner-up alternative, the discharge system upgrades would involve construction of a parallel outfall pipeline to the east of the WWTP and installation of a multi-port diffuser in the South Santiam River. The runner-up alternative also requires an effluent transmission system to allow irrigation of plant effluent on nearby agricultural land. For the preferred alternative, the discharge system includes a new transmission pipeline to the east side of the South Santiam River where effluent would be applied to the ground for rapid infiltration and subsurface discharge to the river. For the purpose of evaluating environmental issues associated with the proposed projects, the on-site projects are assessed together and the off-site effluent projects are assessed separately.

### **On-Site Projects**

The majority of the proposed projects will take place on the existing plant site. These on-site projects include the following:

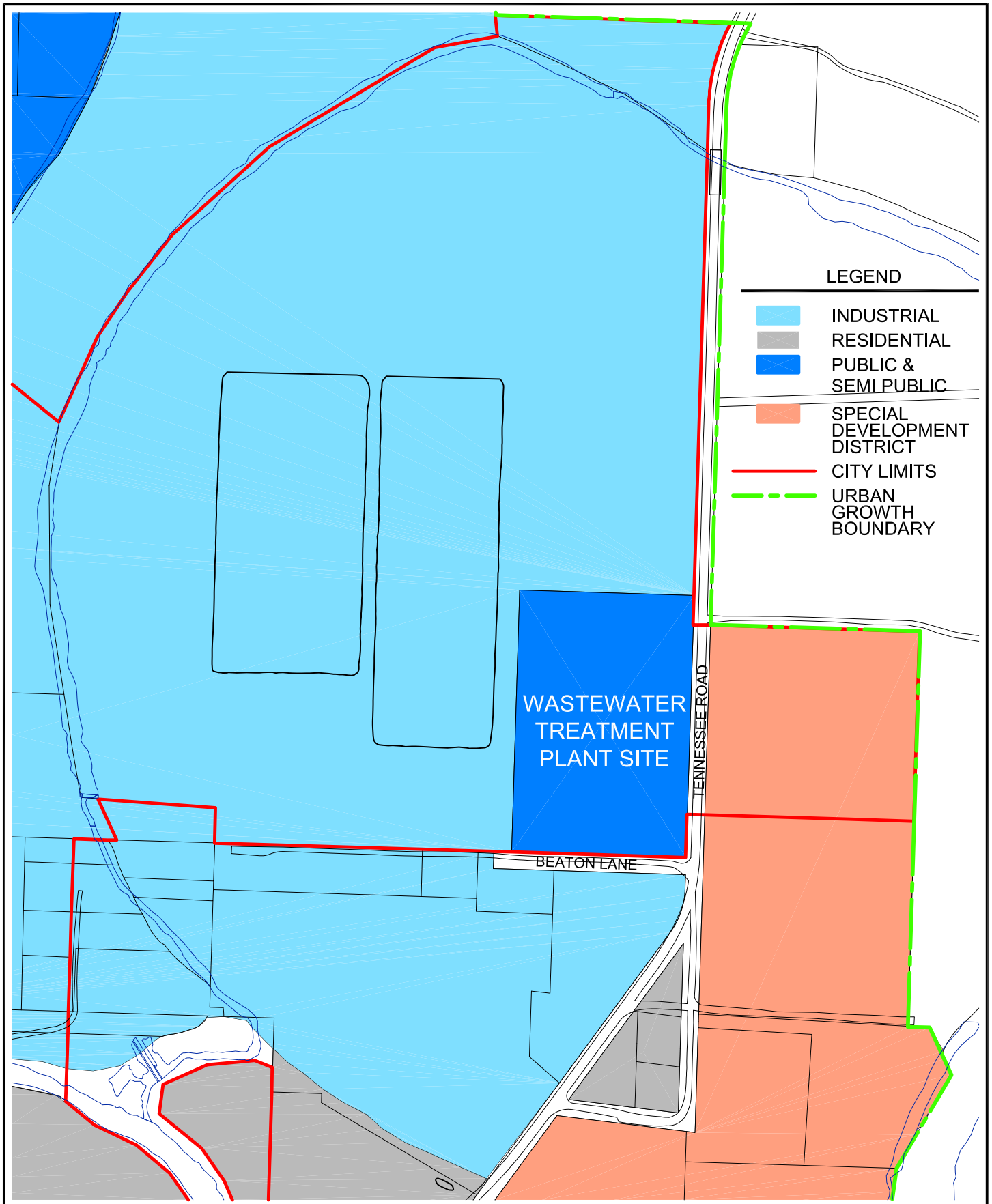
- Headworks Renovations
- Aeration Basin Renovations
- Secondary Clarifier Construction
- Chlorination System Improvements
- Effluent Dechlorination System Construction
- Subsurface Discharge Pump Station or Reuse Pump Station Construction
- Aerobic Digester Renovation
- Solids Dewatering and Storage Facilities Construction
- Septage Receiving Station and Holding Tank Construction
- Administration Building Expansion and Renovation
- Buffer Land Purchase

Following is an evaluation of these projects with respect to important environmental considerations.

### **Land Use/Important Farmland/Formally Classified Lands**

Affected Environment – The on-site improvement projects would be constructed on land currently owned by the City and zoned for either wastewater treatment or general industrial uses. Therefore, no purchase of property is necessary for construction of the proposed improvements. However, the purchase of land adjacent to the WWTP is proposed for creating an adequate buffer around the plant to reduce the risk of odor problems in the neighborhood. Figure 9-1 shows the zoning designations for properties in the vicinity of the WWTP. Land shown outside the UGB is zoned for exclusive farm use.

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0 150' 300'  
SCALE IN FEET

Figure 9-1  
TREATMENT PLANT VICINITY  
LAND USE DESIGNATIONS



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**LEGEND**

 DESIRABLE  
BUFFER AREA

Figure 9-2  
**TREATMENT PLANT VICINITY**  
**POTENTIAL BUFFER AREAS**

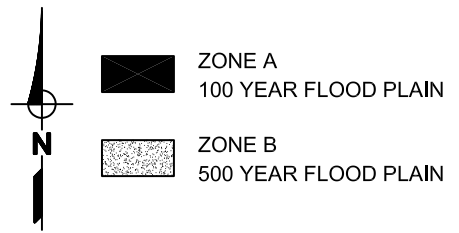
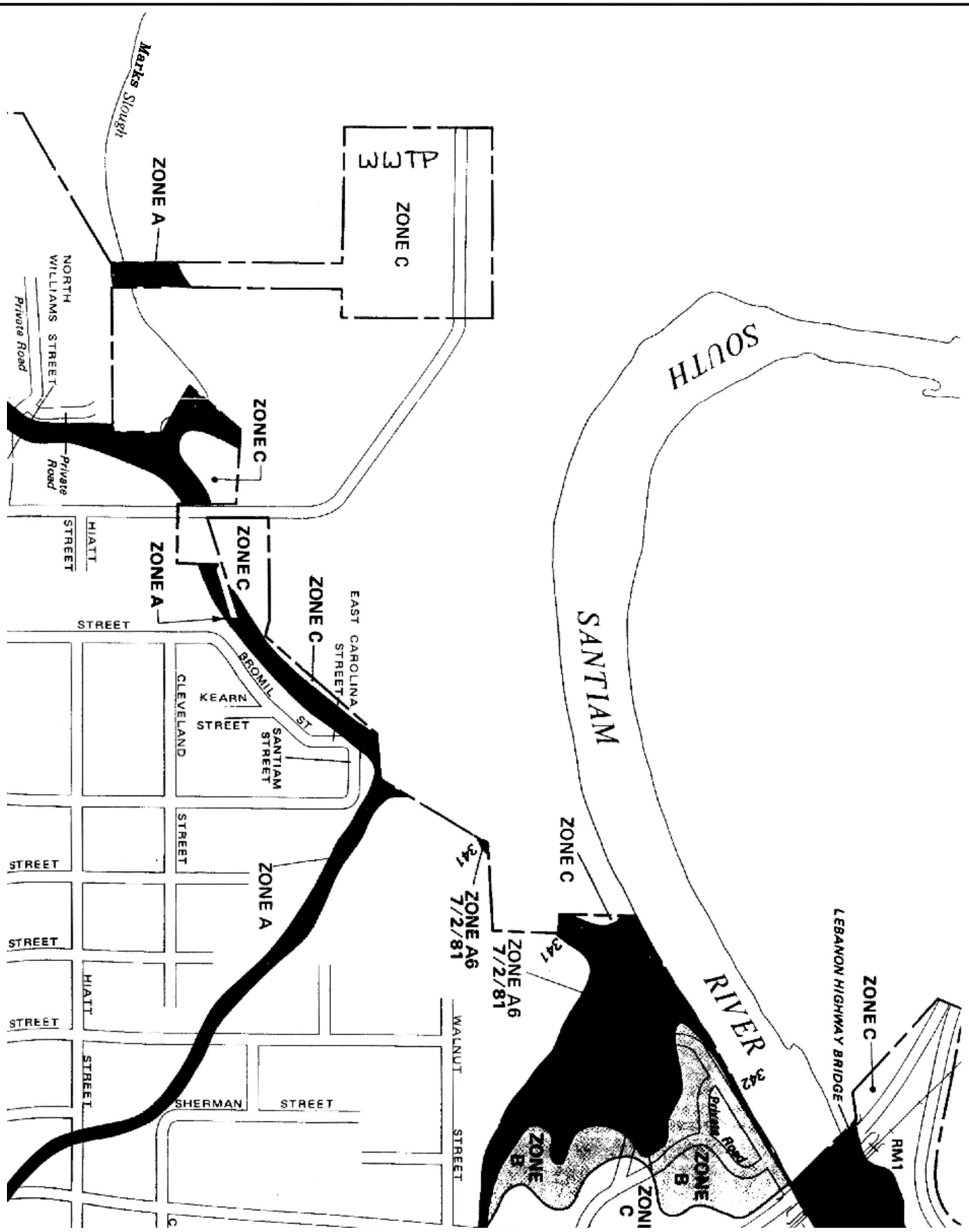
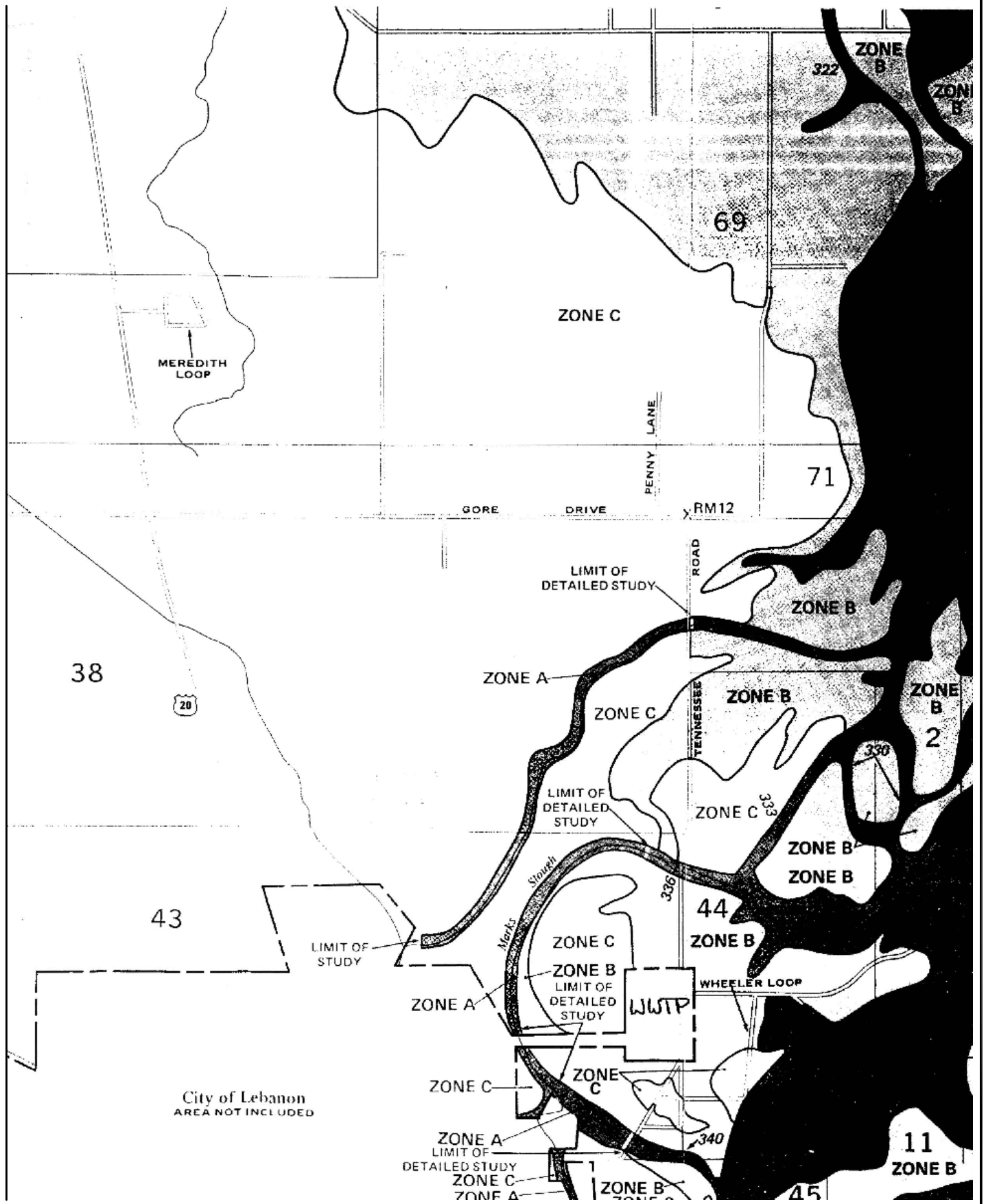


Figure 9-3  
**TREATMENT PLANT VICINITY  
 FOR CITY LIMITS  
 FLOOD PLAIN MAP**

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-  ZONE A  
100 YEAR FLOOD PLAIN
-  ZONE B  
500 YEAR FLOOD PLAIN

Figure 9-4  
**TREATMENT PLANT VICINITY  
 FOR OUTSIDE CITY LIMITS  
 FLOOD PLAIN MAP**



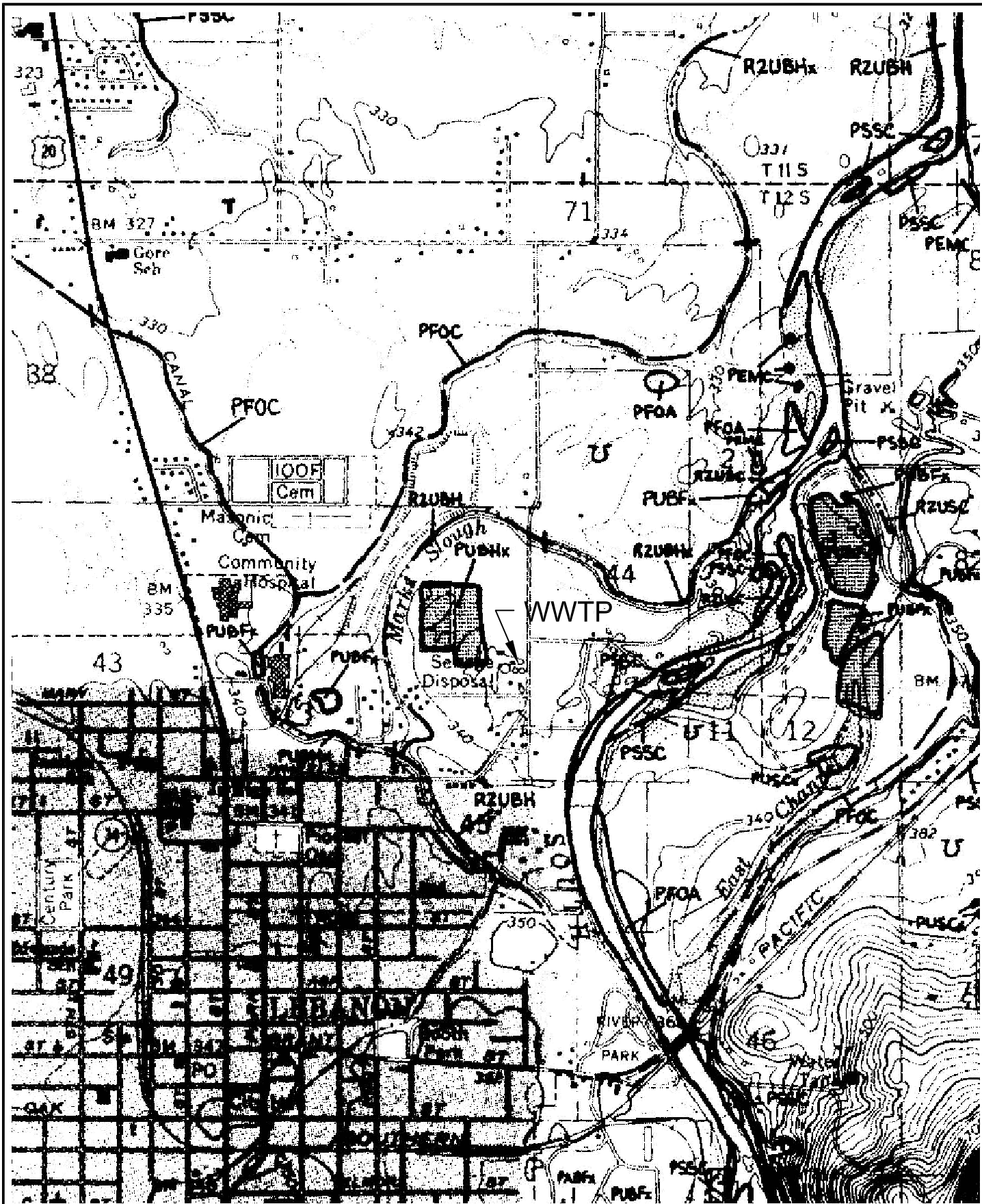


Figure 9-5  
TREATMENT PLANT VICINITY  
NATIONAL WETLANDS INVENTORY MAP



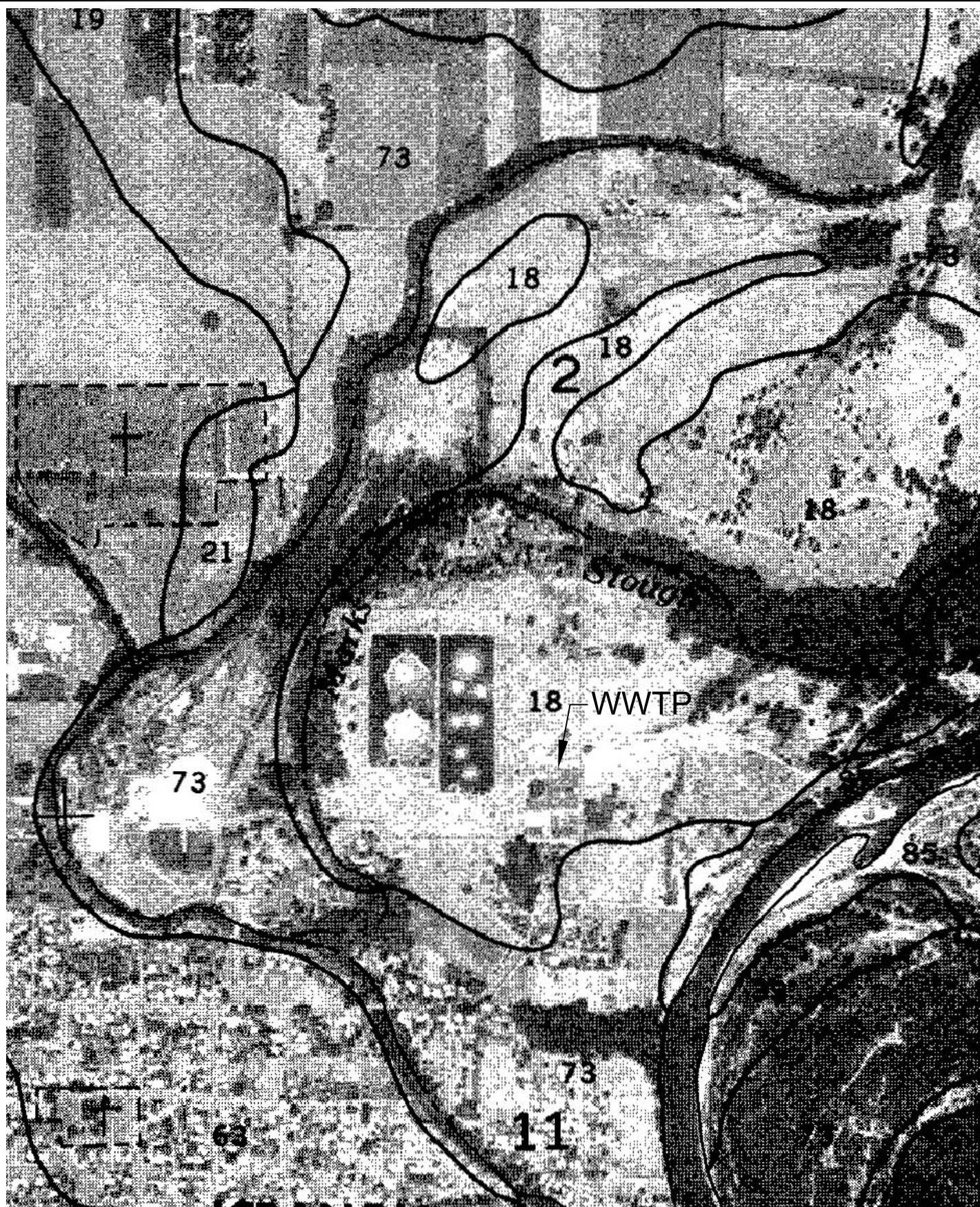


Figure 9-6  
TREATMENT PLANT VICINITY  
SOIL SURVEY

The properties identified as desirable buffer lands, shown in Figure 9-2, are currently zoned for industrial use, exclusive farm use, or as a special development district. As shown in the figure, there is currently only one residence within 300 feet of the WWTP and this property is among those targeted for purchase as buffer land.

None of the land affected by the proposed projects has ever been formally classified by any Federal, State, or local agency.

Environmental Consequences – The proposed projects are consistent with allowed uses and will not require the modification of any zoning designations or land use classifications.

Mitigation – No mitigation measures related to land use are required.

### **Floodplains**

Affected Environment – Figures 9-3 and 9-4 show the area in the vicinity of the treatment plant that is within the 100-year and 500-year floodplains of the South Santiam River. The WWTP itself is outside of the floodplains and is surrounded to the north, east, and south by land within the 500-year floodplain. All of the proposed on-site projects would take place on land outside of the designated floodplains.

Environmental Consequences – The proposed projects do not require any conversion of the floodplain or impacts to the floodplain.

Mitigation – No mitigation measures related to floodplains are required.

### **Wetlands**

Affected Environment – Figure 9-5 is an excerpt from a National Wetlands Inventory map prepared by the US Fish and Wildlife which shows the location of the wetland areas in the vicinity of the treatment plant site. As illustrated in the figure, the former sewage lagoons to the west of the WWTP are designated as wetlands. The acronym associated with the wetlands in the abandoned Lebanon sewage lagoons is PUBHx which signifies an area that is characterized as palustrine with an unconsolidated bottom of cobble, gravel, sand, mud, or organics that is permanently flooded and excavated. None of the proposed improvements would be constructed within this area. Figure 9-6 shows the soil survey map for the area around the WWTP. Soil Type 18 is a non-hydric, excessively drained soil that would likely be classified as upland by a wetland delineation survey.

Environmental Consequences – The proposed improvements do not require development of an area designated as wetlands on the National Wetlands Inventory Map.

Mitigation – No mitigation related to wetlands are required.

## **Cultural Resources**

Affected Environment – None of the areas affected by this project have been listed by the National Register of Historic Places. The Oregon State Historic Preservation Office has cleared the site for construction under Section 106 of the National Historic Preservation Act. The entire area is not visible from any major roadways, scenic overlooks, wilderness areas, or parks; therefore, visual quality will not be affected by the proposed improvements.

Environmental Consequences – It is not anticipated that there are any cultural resources in this area that will be affected by the improvements under consideration. In the event that cultural resources such as archaeological artifacts are discovered during the course of construction, work would be immediately suspended until the State Historic Preservation Office has investigated the discovery and established an appropriate response plan.

Mitigation – No mitigation measures related to cultural resources are anticipated.

## **Biological Resources**

Affected Environment – Since the proposed projects would take place on the developed properties of the WWTP, there are no anticipated impacts to biological resources. The relevant threatened and endangered species in the vicinity of the Lebanon WWTP that were identified by the US Fish and Wildlife Service and National Marine Fisheries Service include the following:

- Bald eagle
- Chinook salmon (Upper Willamette River)
- Oregon chub
- Fender's blue butterfly
- Willamette daisy
- Bradshaw's lomatium
- Kincaid's lupine

There are no known threatened or endangered species on the Lebanon WWTP site that may be affected by the proposed projects. The Chinook salmon is present in the South Santiam River where the Lebanon WWTP discharges effluent. Completion of the proposed projects will ensure that the plant continues to satisfy the NPDES discharge requirements that protect the water quality of the South Santiam River.

Environmental Consequences – There are no known biological resources in the area that will be adversely affected by the proposed projects. The recommended improvements will improve water quality in the South Santiam River.

Mitigation – No mitigation measures related to biological resources are required.

## **Water Quality Issues**

Affected Environment – Lebanon’s WWTP effluent is discharged to the South Santiam River which is included on the DEQ’s 303(d) list of streams that do not meet water quality standards. The South Santiam is included on the 303(d) list due to historic data showing that the river sometimes exceeds the temperature standard. The City’s discharge can add to the river’s thermal load during times of the year when the river is in violation of the temperature standard.

Environmental Consequences – The proposed projects reduce the potential for water quality impacts on the South Santiam River. The City holds an NPDES permit and MAO from the DEQ which identifies limitations for waste discharges to the South Santiam River during both the wet weather and dry weather seasons. Implementation of the proposed projects will allow the City to continue complying with these limitations to assure that water quality in the receiving stream is maintained at required levels.

Mitigation – No mitigation measures are required. Compliance with the City’s NPDES permit requirements will protect water quality on the South Santiam River.

## **Coastal Resources**

Affected Environment – There are no coastal resources impacted by the proposed projects.

Environmental Consequences – No environmental consequences to coastal resources are relevant to the Lebanon treatment plant.

Mitigation – No mitigation measures are required.

## **Socio-Economic/Environmental Justice Issues**

Affected Environment – The WWTP, located on the northeast edge of town, is surrounded by land zoned for industrial uses and a special development district as illustrated previously in Figure 9-1. The residential population in the immediate vicinity of the treatment plant is extremely small. As previously shown in Figure 9-2, there is only one residence within 300 feet of the plant.

Environmental Consequences – The proposed projects would not cause any adverse effects on surrounding populations. The adjacent properties are targeted for purchase as buffer land which would help prevent the future development of residential areas in close proximity to the WWTP, thus reducing the potential for land use conflicts.

Mitigation – Properties adjacent to the WWTP are targeted for purchase as buffer land in order to minimize the potential for land use conflicts with existing or future neighbors.

## Miscellaneous Issues

### Air Quality/Odors

Affected Environment – Properties immediately adjacent to the WWTP may be affected by minor vehicle and dust emissions during the construction of improvements. Also, the WWTP is a potential source of odor to the surrounding neighborhood in the event of an upset to the biological process.

Environmental Consequences – Odor is a potential nuisance that needs to be avoided by maintaining proper performance of the treatment process. However, the surrounding population is very small since there is only one residence within 300 feet of the WWTP. The City is not required to maintain an air quality permit and currently has no records of odor complaints with respect to operation of the WWTP. Air quality disruptions due to construction of the proposed improvements will only be temporary and are not expected to be excessive enough to require any air quality permits.

Mitigation – Several of the proposed plant upgrades will reduce the potential for odor problems in the vicinity of the WWTP. These upgrades include increased aeration capacity for the aeration basins and additional mixing in the aerobic digester. Further, the proposed projects include the purchase of buffer lands which will reduce the potential for odor related disturbances by minimizing the possibility of conflicting land uses.

### Airport Clear Zones

Affected Environment – Lebanon State Airport is located approximately two miles southwest of the WWTP on the west edge of the city. Title 14 of the FAA Code of Regulations does not require submission of a notification of construction. Only small planes utilize this airport and no conflicts are expected with the proposed projects.

Environmental Consequences – There are no consequences associated with the proximity of the Lebanon State Airport to the proposed construction.

Mitigation – No mitigation measures are required.

### Safety Hazards

Affected Environment – There are potential environmental and safety hazards associated with certain chemicals used in the treatment process. Liquid hypochlorite is used for chlorination and sodium bisulfite is proposed for dechlorination. Although these chemicals are toxic in high concentrations, these chlorination/dechlorination processes are widely used and the necessary safety/environmental protocols are easily maintained.

Environmental Consequences – Chemicals used in the treatment process would pose environmental and safety concerns if leaked into the surrounding environment. The risk of leaks is greatly reduced by maintaining adequate containment systems.

Mitigation – The WWTP maintains the necessary safety and environmental controls for handling and storing chlorination chemicals. These same types of containment systems will be included in the proposed dechlorination system.

### **Effluent Discharge System Improvements**

Improvements to the plant's effluent discharge system will take place largely off the treatment plant site. As such, the environmental issues are somewhat different than for the on-site improvement projects. For the runner-up alternative, the discharge system improvements would include the construction of a new multiport outfall diffuser in the South Santiam River and construction of a parallel outfall pipeline between the WWTP and river. The runner-up alternative would also include the construction of a reuse pipeline to nearby farm land for irrigation of effluent during the dry weather season. For the preferred alternative of subsurface discharge to the river, the effluent discharge system improvements would include the construction of a new transmission force main, a bored crossing of the river, and effluent infiltration systems. Following is an evaluation of the outfall improvements with respect to important environmental considerations.

### **Land Use/Important Farmland/Formally Classified Lands**

Affected Environment – For the runner-up alternative, construction of the parallel outfall pipeline would take place in land zoned for exclusive farm use. Construction of the multiport outfall diffuser would take place in waters of the State.

Construction of a transmission pipeline for an effluent reuse program would largely take place on land zoned for agricultural uses. The ultimate alignment for the reuse pipeline is unknown since it would depend on the location of the agricultural land contracted for irrigation. Once irrigation contracts are in place, the City would involve key stakeholders such as the Natural Resource Conservation Service in the determination of an appropriate pipeline alignment.

For the preferred alternative, the new transmission force main would follow the same alignment as the existing outfall pipeline across land zoned for exclusive farm use. The bored crossing of the South Santiam River would be within property of the State. The area targeted for infiltration/subsurface discharge of effluent is zoned for exclusive farm use.

For all of the alternatives under consideration, none of the land affected by the projects has ever been formally classified by any Federal, State, or local agency. The affected lands are located outside of the City's urban growth boundary and are under the jurisdiction of Linn County.

Environmental Consequences – The improvements under consideration will not require modification of any zoning designations or land use classifications. The proposed uses are allowed, although the City will likely be required to obtain special use permits from the County. Also, construction of the pipelines would require obtaining new easements and/or modifying existing easements.

Mitigation – The City will perform all required permitting activities as required by the County prior to implementation of the projects. The special use permitting process will include opportunities for public review and comment.

## **Floodplains**

Affected Environment – Figures 9-3 and 9-4, presented earlier, show the area surrounding the treatment plant that is within the 100-year and 500-year floodplains of the South Santiam River.

For the runner-up alternative, installation of the parallel outfall pipeline would require the clearing and excavation of a narrow strip of land extending from the WWTP to the South Santiam River, approximately 1,200 feet in length. Inspection of the figures indicates that the parallel outfall pipeline will partially be located within floodplain areas. Similarly, portions of the effluent reuse pipeline would likely be located within the floodplain area. Construction of these pipelines would not require any permanent conversion of the floodplain.

The preferred alternative would also involve pipeline construction within the floodplain of the South Santiam River, but would not require any permanent conversion of the floodplain.

Environmental Consequences – The projects under consideration do not require any conversion of the floodplain. Pipeline construction will cause only temporary disturbance in the floodplain.

Mitigation – The areas disturbed during construction of the discharge system improvements would be restored to their original condition. Clearing of riparian vegetation would be minimized during the construction and all construction activity would take place during the summer months to reduce impacts to the floodplain. In order to perform construction within the normal high water lines of the South Santiam River, the City will obtain a Clean Water Act, Section 404 permit. The construction specifications for the outfall project will require contractors to comply with all conditions contained in the City's 404 permit.

## **Wetlands**

Affected Environment – Figure 9-5, presented earlier, shows the location of the wetland areas surrounding the site. Inspection of the figure indicates that there are no wetlands present between the WWTP and the river. There are wetland areas shown along the edges of the river and this observation was confirmed by wetland determinations recently conducted by the City.

For the runner-up alternative, installation of the parallel outfall pipeline would require the clearing and excavation of a narrow strip of land extending from the WWTP to the South Santiam River, approximately 1,200 feet in length. A portion of this alignment would cross jurisdictional wetlands along the river edge. Although an alignment for the effluent reuse pipeline is undetermined at this time, construction of the pipeline would be conducted to minimize impacts on wetlands.

For the preferred alternative, installation of the river crossing could potentially affect wetlands along the edge of the river. However, the sites for the bore pit and receiving pit could be selected so as to minimize the potential for impacts on jurisdictional wetlands.

Environmental Consequences – The projects under consideration do not require permanent conversion of any wetlands. The runner-up alternative would involve temporary impacts to wetlands along the river edge whereas it may be possible to avoid these impacts with the preferred alternative through careful siting of the boring pits.

Mitigation – The areas disturbed during construction of the discharge system improvements would be restored to their original condition. Clearing of riparian vegetation would be minimized during the construction and all construction activity would take place during the summer months to reduce impacts to wetlands. The construction contractor will be required to implement erosion control measures in order to minimize the potential for impacts to wetlands.

## **Cultural Resources**

Affected Environment – None of the areas affected by the projects under consideration have been listed by the National Register of Historic Places. The Oregon State Historic Preservation Office has cleared the area for construction under Section 106 of the National Historic Preservation Act. The entire area is not visible from any major roadways, scenic overlooks, wilderness areas, or parks; therefore, the visual quality will not be affected by the proposed project.

Environmental Consequences – It is not anticipated that there are any cultural resources in this area that will be affected by the improvements under consideration. In the event that cultural resources such as archaeological artifacts are discovered during the course of construction, work would be immediately suspended until the State Historic Preservation Office has investigated the discovery and established an appropriate response plan.

Mitigation – No mitigation measures related to cultural resources are anticipated.



## **Biological Resources**

Affected Environment – As noted earlier, the relevant endangered species in the vicinity of the Lebanon WWTP that were identified by the US Fish and Wildlife Service and National Marine Fisheries Service include the following:

- Bald eagle
- Chinook salmon (Upper Willamette River)
- Oregon chub
- Fender's blue butterfly
- Willamette daisy
- Bradshaw's lomatium
- Kincaid's lupine

With the exception of Chinook salmon in the South Santiam River, none of the identified species are known to be present in the vicinity of the projects under consideration. In any event, surveys to confirm or discount the presence of these species would be conducted prior to the design of improvements so that the facilities can be modified as necessary to avoid impacts to plant and animal species of concern.

Environmental Consequences – The planned improvements have been selected to ensure that the plant will continue to satisfy the NPDES discharge requirements that protect the water quality of the South Santiam River. Although the long term effects of the projects under consideration will improve water quality and habitat for the Chinook salmon, temporary habitat disturbance would take place during construction of the discharge system improvements. Since the preferred alternative involves boring under the river, the potential temporary impacts on wildlife habitat associated with construction are significantly reduced compared to the runner-up alternative where in-river work is required. Further, the preferred alternative uses the earth to cool the effluent before it reaches the river, thus significantly reducing thermal impacts that can degrade fish habitat in the South Santiam.

Mitigation – The City will obtain a 404 permit from the Division of State Lands and the US Army Corps of Engineers prior to construction. The construction would be scheduled during the designated in-river work period when the Chinook salmon are not spawning, incubating, or rearing. The construction specifications for the discharge system improvements will require contractors to comply with all conditions and mitigation requirements contained in the City's permit.

## **Water Quality Issues**

Affected Environment – For the runner-up alternative, the improvements would provide a new outfall to the South Santiam River. The existing outfall is an overland/shoreline discharge system that provides poor mixing between the effluent and river water. Without adequate dilution of the effluent plume, there is a potential for pollutant concentrations to exceed water quality standards. The multiport diffuser would improve mixing and eliminate the potential for excessive pollutant concentrations. Also, as part of the runner-

up project, Level III reclaimed effluent would be applied to nearby agricultural lands during the summer months. Reclaimed effluent irrigation is regulated by the DEQ which requires that the effluent be applied at agronomic rates to maintain the water quality of subsurface water sources.

For the preferred alternative, the improvements would include an infiltration system for subsurface discharge to the river. This discharge method would also improve mixing of the effluent plume, likely providing better mixing than would be available from a multiport diffuser that discharges directly to the river. Hydrogeologic investigations of the infiltration site have confirmed that the near surface groundwater gradient is always toward the river. Given this situation, no adverse impacts are anticipated to the quality of the deeper groundwater that is used as a drinking water resource. Further, the preferred alternative uses the earth to cool the effluent before it enters the river. This cooling significantly reduces the thermal load that the treatment plant discharge would otherwise deliver to the river.

Environmental Consequences – For the runner-up alternative, construction activities may temporarily affect water quality during excavation for the new outfall pipeline and installation of the multiport diffuser. However, over the long term, implementation of the improvements would greatly improve water quality in the vicinity of the effluent outfall. Although currently unknown, the alignment of the reuse pipeline would be selected to minimize the potential for water quality impacts during construction and implementation of a DEQ approved water management plan would ensure that irrigation practices adequately protect surface and subsurface water quality.

There may be minor temporary impacts during construction of the preferred alternative, although boring of the river crossing will greatly reduce the potential for any significant water quality impacts. In any event, the construction related impacts on water quality will be far less significant than those that would be associated with the in-river work required to construct the runner-up alternative. As noted above, evaluations of the infiltration site indicate that there will be no adverse impacts to the deep groundwater resource. The preferred alternative also provides the additional benefit of cooling the effluent before it enters the river. Subsurface discharge would also be expected to reduce mass loading to the river and may provide additional effluent polishing benefits as well.

Mitigation – For all of the improvements under consideration, temporary erosion and sedimentation impacts will be minimized through careful construction site management. The potential for erosion will be further minimized since the major construction activities would be conducted during the dry weather season. The project will comply with DEQ NPDES Storm Water Regulations for Construction Projects and a DEQ approved erosion and sediment control plan will be developed and implemented to comply with 1200-C permit regulations. The areas disturbed during construction of the improvements would be restored to their original condition. The 404 permit conditions will also be implemented during construction to ensure that water quality issues are addressed.

In addition, for the runner-up alternative, the reuse program would be conducted in accordance with a DEQ approved water management plan. For the preferred alternative, the subsurface discharge program will include ongoing groundwater monitoring to ensure that there are no water quality impacts.

### **Coastal Resources**

Affected Environment – There are no coastal resources impacted by the proposed project.

Environmental Consequences – No environmental consequences related to coastal resources are relevant to the project.

Mitigation – No mitigation measures are required.

### **Socio-Economic/Environmental Justice Issues**

Affected Environment – The effluent discharge system improvements will take place on undeveloped land that is zoned for agricultural uses. The nearest residence is more than 600 feet away. Following construction, monitoring programs will be implemented to ensure that there are no ongoing environmental impacts that would affect surrounding populations.

Environmental Consequences – The improvements under consideration would not cause any adverse effects on surrounding populations.

Mitigation – No mitigation measures are required.

### **Miscellaneous Issues**

#### **Air Quality/Odors**

Affected Environment – Minor vehicle and dust emissions may occur during construction of the effluent discharge system improvements. However, the surrounding population is very small since there is only one residence within 600 feet of the WWTP.

Environmental Consequences – Air quality disruptions due to construction will only be temporary and are not expected to be excessive enough to require any mitigation.

Mitigation – No mitigation measures are required.

#### **Airport Clear Zones**

Affected Environment – Lebanon State Airport is located approximately two miles southwest of the construction site on the west edge of the city.

Environmental Consequences – There are no consequences associated with the proximity of the Lebanon State Airport to the proposed improvements.

Mitigation – No mitigation measures are required.

## **Safety Hazards**

Affected Environment – The effluent discharge system improvements do not pose a safety hazard to the surrounding environment.

Environmental Consequences – The outfall improvements do not pose any safety hazards.

Mitigation – No mitigation measures related to the outfall improvements are required.

## **SUMMARY OF MITIGATION**

Several mitigation measures were developed to minimize any adverse affects associated with the proposed improvement projects. These measures are summarized in Table 9-1 along with the implementation criteria and measures of enforcement.

## **SUMMARY OF PUBLIC INVOLVEMENT**

The City has utilized several methods of outreach to encourage public involvement in the review and development of the facilities plan during the past several years. The public involvement activities implemented for this facilities plan include the following:

- Capital Improvement Plan Commission Presentation on February 12, 2001 to discuss the preliminary facilities plan recommendations.
- City Council Presentation on December 10, 2003 to discuss findings from the hydrologic assessment of the subsurface discharge alternative. The Council passed a motion to officially move forward with the subsurface discharge alternative.
- Town Hall Meeting on February 26, 2004 to discuss the facilities planning update process for incorporating the subsurface discharge alternative. The City provided public advertisements for this meeting on Wednesday, February 18, 2004 in the Lebanon Express as well as on Sunday, February 22, 2004 in the Albany Democrat Herald and Corvallis Gazette Times.
- City Council Workshop on April 14, 2004 to review the final draft facilities plan.
- Public Hearing on April 28, 2004 to present the final draft facilities plan and receive comments.

## **CONCLUSIONS ON ENVIRONMENTAL IMPACTS**

The environmental impacts associated with the runner-up and the preferred alternative are generally similar. However, the preferred subsurface discharge alternative does provide distinct advantages during the construction of improvements as well as during ongoing operation of the facilities. By avoiding the need to perform in-river construction, the preferred alternative can be constructed in a manner that significantly reduces the potential for temporary impacts to water quality and fish habitat. Perhaps more important, however, is the long term benefit of effluent

cooling provided by the subsurface discharge alternative. This reduction in the plant's thermal load to the South Santiam River is accomplished by using the earth as a heat sink before the effluent enters the river. The alternative of providing mechanical cooling of the effluent with chillers would have significantly higher capital and operational costs. Subsurface discharge would also be expected to reduce mass loading to the river and may provide additional effluent polishing benefits such as chlorine oxidation and nitrification. The significant environmental advantages of the subsurface discharge approach along with the lower capital cost and lower operation and maintenance costs confirm the appropriateness of its selection as the preferred alternative.

**Table 9-1. Mitigation Options**

Mitigation Measure	Implementation	Enforcement
1. Purchase surrounding property as buffer land to reduce the potential for land use and odor conflicts.	The City will monitor the real estate market in the immediate vicinity of the plant for purchase opportunities and negotiate land purchases when feasible.	Capital costs for the purchase of buffer land will be included in the City's capital improvement plan.
2. Provide adequate containment systems for chlorination and dechlorination chemicals.	The existing chlorination system is located within a containment system and the design of a new dechlorination will also provide adequate containment.	The DEQ will review the design of dechlorination improvements and confirm that containment systems are provided for the chemical storage and feed systems.
3. Obtain land use approvals for construction of improvements.	The City will submit the required special use permit applications to Linn County and provide all information necessary for public review and comment.	Linn County will ensure that all land use regulations are satisfied during the special use permitting process.
4. Restore temporarily disturbed areas of the floodplain during pipeline construction.	The pipeline alignments will be restored to their original condition following construction.	The construction specifications will require that restoration work is included in the contractor's scope of services.
5. Time construction activities to avoid damage to the floodplain and wetlands.	Construction will begin during the summer months, once the ground has substantially dried out.	The engineering firm will establish a construction start date that ensures favorable ground conditions.
6. Provide sediment and erosion control measures during construction.	All construction activities will comply with an approved sediment and erosion control plan developed per 1200-C permit regulations and 404 permit conditions. Careful attention will be placed on erosion control, particularly when working in close proximity to the South Santiam River.	The construction specifications will require development of a sediment and erosion control plan. Regular inspections of the erosion control structures will be conducted.
7. Protect public health during the implementation of the subsurface discharge program.	Conduct ongoing monitoring of the deep groundwater resource in the vicinity of the effluent infiltration and subsurface discharge area.	It is anticipated that as a condition of permitting the subsurface discharge program, the City will be required to regularly report to the DEQ on the results of deep groundwater resource monitoring.