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WASHINGTON COUNTY

LANDFILL INVENTORY SITE G ENVIRONMENTAL IMPACT STATEMENT FINAL SCOPING DECISION

August, 1988

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Donohue & Associates Inc. Bruce A. Liesch Associates, Inc. Genereux Social Science Research

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CONTENTS

| I. | EXECUTIVE SUMMARY | 1 |
|------|---|---|
| II. | SUMMARY OF LANDFILL DEVELOPMENT PROCESS | 2 |
| III. | PROJECT DESCRIPTION | 5 |
| IV. | SCHEDULE | 6 |
| v. | ISSUES AND REQUIRED STUDIES | 6 |
| | A. Site Design and Construction. B. Geologic and Hydrogeologic Impacts. C. Surface Water Impacts. D. Landfill Gas Impacts. E. Flora and Fauna. F. Visual Impacts. G. Air Quality Impacts. H. Noise. I. Nuisance Factors. J. Traffic. K. Health Risk of Potential Pollution. L. Archaeological/Historical Resources. M. Land Use. N. Park Use/Park Planning Impacts. Q. Airport Impacts. R. Legal Issues. | 6 13 20 22 25 26 27 28 29 31 32 35 37 39 41 |
| VI. | ALTERNATIVES | 42 |
| VII. | PERMITS | 44 |

I. <u>EXECUTIVE SUMMARY</u>

In accordance with the requirements of the 1980 Minnesota Waste Management Act, Washington County is conducting a landfill siting process. The siting process has narrowed the search for a landfill site to Site G, located west of Eagle Point Lake in the City of Lake Elmo.

This scoping decision describes the background of the siting process; describes the proposed project, a 2,494 acre-foot landfill for solid wastes; presents a detailed list of the issues identified to date for study in the Environmental Impact Statement (EIS); and sets a tentative schedule for EIS preparation.

The following issues have been identified for study in the EIS. These issues, and the proposed EIS studies, are described more fully in the body of this draft report.

- A. Site Design and Construction
- B. Geologic and Hydrogeologic Impacts
- C. Surface Water Impacts
- D. Landfill Gas Impacts
- E. Flora and Fauna
- F. Visual Impacts
- G. Air Quality Impacts
- H. Noise Impacts
- I. Nuisance Impacts
- J. Traffic Impacts
- K. Health Risks of Potential Pollution
- L. Archaeological/Historical Resources

M. Land Use

- N. Park Reserve Use/Park Reserve Planning Impacts
- O. Municipal Government Issues
- P. Socio-Economic Impacts
- Q. Airport Impacts
- R. Legal Issues

II. <u>SUMMARY OF THE LANDFILL DEVELOPMENT PROCESS</u>

<u>History</u>

The Minnesota Waste Management Act of 1980 empowered the Metropolitan Council to manage solid waste planning in the metropolitan area, with the purpose of emphasizing recovery of resources and minimizing land disposal. This document represents one step in the planning process. The following discussion summarizes the process as it applies to landfill development. The same legislation and governmental agencies are also involved in the development of solid waste processing systems, waste reduction programs and source separation systems.

Each of the seven metropolitan area counties (Anoka, Carver, Dakota, Hennepin, Ramsey, Scott and Washington) was required to prepare a solid waste master plan and to conduct a search for candidate landfill sites beginning in 1980 (Minn. Stat., Sec. 473.803). Concurrently, the Metropolitan Council was required to prepare a longrange sold waste policy plan and to review and approve the candidate sites in order to develop an inventory list to meet the region's land disposal needs to the year 2000 (Minn. Stat., Sec. 473.149). As a part of the policy plan, the Metropolitan Council was to review the need for landfill space until the year 2000, examine existing landfill capacity, and determine if additional space is required. Then based on the need for space and the location of existing facilities, the Council was to select the counties which must develop a landfill.

Washington County began the siting process in 1980 in cooperation with the Metropolitan Inter-County Association (MICA). A Solid Waste Advisory Committee was formed to advise the County Board on this process. The County Board developed siting criteria which were used by a team of consultants contracted by MICA to screen potential sites. The initial phase of the process involved the development of exclusion areas and the selection of search areas within which candidate sites could be identified. Public hearings were held and County staff review of the exclusion area map was conducted before the search areas were selected.

The next phase of the site selection process involved studying the search areas to determine if candidate landfill sites were feasible to locate within them. The candidate sites were required by Statute to have at least 80 acres and not more than 250 acres available for landfill development, and to have a buffer area at least equal in size to the landfill area. Each county had to select five sites as candidates; four as possible sites for mixed municipal waste and one for demolition debris. Washington County selected five sites, designated Sites C, E, F, G and H, for consideration.

The Waste Management Act then required that the selected sites next be evaluated by the Minnesota Pollution determine if they were Control Agency (MPCA) to intrinsically suitable for landfill development. Each site was evaluated by the MPCA according to criteria set forth in Minnesota Regulation SW-6. The requirements consider environmental, geologic and engineering To be certified as intrinsically suitable, constraints. it was necessary to show that a site has either the natural conditions or could be modified using accepted engineering techniques to provide protection of human health of the environment. Certification was based on an indication that, based on preliminary data, the site would likely withstand the more intense evaluation necessary to obtain a landfill permit. The MPCA staff initially recommended that Sites C, F, G, and H be certified. A public hearing was then held before a hearing examiner, followed by additional testimony to the MPCA Citizen Board. The final determination made by MPCA was to certify Sites C and E for demolition debris and Sites F and G for sanitary landfill. In December, 1981, Washington County submitted Site Ε (as а demolition debris disposal site) and Sites F and G (as mixed municipal disposal sites) to the Metropolitan Council for inclusion in the landfill site inventory. Because the required number of four candidates mixed municipal sites was not met, the County also requested a reduction in the required number of sites. The request was not granted.

The sites submitted by the County were next reviewed by the Metropolitan Council staff. After considering the consultant reports the siting process, of the Metropolitan Physical Development Committee recommended that Site F not be approved because of proximity to a water supply well field, Site G be approved for disposal of mixed municipal solid waste and the Council consider reducing the number of required sites. In August, 1982, the Metropolitan Council approved Sites E (Demolition waste) and G (mixed municipal solid waste), did not approve Site F and requested the County search for alternate sites.

Following a second site search by Washington County, three new sites, Sites AA, BB and CC were proposed. None of these sites were submitted to the MPCA to be evaluated for intrinsic suitability as County staff judged them inadequate. In addition, the Metropolitan Council was investigating sites in New Scandia and Woodbury, also located in Washington County. The sites in New Scandia and Woodbury were later rejected by the Metropolitan Council. In June, 1984, the Metropolitan Council reduced the required number of inventory sites in the County to one. This ended the siting process. Thus, three siting efforts were undertaken, and over thirty public hearings held.

In September, 1984, the Metropolitan Council announced the landfill siting process was completed. Recognizing the difficulty in finding suitable sites, Washington County was not required to continue the process. Site G remained the only site approved during the inventory process.

The Waste Management Act required the Metropolitan Council to prepare a development schedule for regional land disposal facilities. That schedule was adopted by the Council, as part of its Policy Plan, in March, 1985. The schedule states that three Counties are to develop landfills by year 2000: Anoka County (3,000 acre-feet in 1987); Hennepin County (3,232 acre-feet in 1991) and Washington County (2,494 acre-feet in 1993). All other counties were then dropped from consideration.

The Act required Counties to prepare an Environmental Impact Statement for each candidate site in their respective inventories. Each County acts as the Regulatory Governmental Unit and conducts its environmental review in accordance with Minnesota Environmental Quality Board rules.

Environmental Assessment Worksheet (EAW) is the The first step in detailed analysis of the impacts of developing a landfill at Site G. It presents background information and is used as a tool for the general public and appropriate agencies to provide comments and raise issues to be addressed in the subsequent Environmental Completion of the EIS is Impact Statement (EIS). mandatory (Minn. Stat. 473.833 subd. 2a and Minnesota The Scoping Decision defines Rule 4410.4300 subp. 17). the issues to be studied and the methodologies to be used. Public comment received during the process will be included in the Scoping Decision.

III.PROJECT DESCRIPTION

The proposed project involves the possible development of a sanitary landfill. In accordance with the Minnesota Waste Management Act of 1980, Washington County conducted a siting process to identify potential landfill sites. The process was conducted in cooperation with the Metropolitan Inter-County Association. Only one site identified during the inventory process, Site G, was deemed intrinsically suitable for landfill development by the Minnesota Pollution Control Agency (MPCA) and approved by the Metropolitan Council. The site is 388 acres in size, located in the southeast quarter of Section 21, the southwest quarter of Section 22 and the northwest quarter of Section 27, Township 29 North, Range 21 West, Lake Elmo.

The Solid Waste Management Development Guide/Policy Plan adopted by the Metropolitan Council in 1985 states that Washington County shall develop a sanitary landfill with a capacity of 2,494 acre-feet by 1993 to help meet the regional demand for landfill space. It is anticipated that the material landfilled will consist predominantly of residuals from solid waste processing facilities, including residuals from RDF facilities and/or ash from solid waste incinerators.

Preparation of an Environmental Impact Statement (EIS) is mandated by state statute (Minn. Rule 4410.420 subp. 17 and Minn. Stat. 473.833 subd. 2a). The EIS will evaluate the potential impacts of possible landfill development at Site G. Washington County is acting as the Responsible Governmental Unit (RGU) for the environmental review process. The EIS will be prepared in accordance with the rules of the Minnesota Environmental Quality Board.

The EIS will be considered by a site selection authority, which will be responsible for the decision to select a landfill site. The site selection authority is made up of the Washington County Board of Commissioners, and a representative from the City of Lake Elmo. It will make its decision following a determination by the county of the adequacy of the EIS.

The Waste Management Act requires an environmental impact evaluation of only that site on the Washington County Landfill Site Inventory approved by the Metropolitan Council (Site G). The Act prohibits any re-examination of sites not on the Landfill Site Inventory. IV. SCHEDULE

The following is a tentative schedule for EIS preparation:

| Date | Action |
|-------------------|--|
| 12-15-87 | County Board approves EAW |
| 12-28-87 | Notice of scoping period published in EOB |
| 1-20-87 | Public Scoping Meeting |
| 1-27-88 | Scoping Period Ends |
| 8-88 | County Board issues final Scoping |
| 9-88 | County Board Authorizes EIS preparation |
| Summer, 1989 | Draft EIS submitted to County |
| Summer, 1989 | Notice of availability of draft EIS |
| Late Summer, 1989 | Public meetings on draft EIS |
| Fall, 1989 | Final EIS submitted to County |
| Fall, 1989 | Final EIS adopted by County Board |

V. ISSUES AND REQUIRED STUDIES

During the preparation of the Environmental Assessment Worksheet (EAW), a number of issues were identified for evaluation in the EIS. These issues are presented in this section. The list will be revised following the scoping period to reflect comments received by the County. The revised scoping decision must be reviewed and approved by the County Board of Commissioners before the EIS can be initiated.

The EIS will study environmental issues in sufficient depth to evaluate the potential impacts of landfill development. The methodologies used to study the issues are important in providing the depth of study necessary for an informed decision to be made. In addition to the identification of issues, a list of required studies is provided to described methodologies selected for use in the EIS. If necessary, the list of required studies will also be revised following the scoping period based on comments received by the County.

A. <u>SITE DESIGN AND CONSTRUCTION</u>

Preliminary design concepts generally form the basis of the ultimate design which would follow later during the permitting process should Site G be developed. The designs prepared for the siting study and the EAW were preliminary to demonstrate that a landfill of reasonable size could be developed at Site G. For the EIS, a design encompassing all the major elements required in the draft MPCA rules and the Washington County Solid Waste Management Ordinance will be presented. Major items are presented in the following section. One conceptual design for a 2,494 acre-feet landfill will be prepared. This design will not include the level of detail necessary to receive a permit. Additionally, cost estimates will be prepared based on the preliminary design.

<u>ISSUES</u>

The information developed in the site design task will serve as input to many of the other impact analysis tasks. Mitigative measures identified in those tasks will, in turn, be reflected back into the site design task.

Site specific issues to be addressed in the EIS include the following:

- o Optional liner designs and materials.
- o Optional cover design and materials.
- Landfill construction base grade, final grades, height, shape, area.
- o Leachate generation, collection, handling and treatment.
- o Screening and security.
- o Different waste types, quantities and impact on design.
- o Soil borrow sources.
- Cost of initial development, operations, maintenance, long-term monitoring, conversion to end use.
 Alternatives for operations and waste handling

REQUIRED STUDIES

1. Base mapping.

Contour maps will be produced from aerial photographs. These maps will be used in all sections of the EIS that require plan sheets.

2. Define extent and location of fill area.

Information gathered in the hydrogeologic investigation, along with other data, will be used to determine the area that is available for landfill development. Delineated buffer area will be evaluated in terms of its ability to mitigate potential adverse impacts. 3. Waste types and quantities.

The Metropolitan Council has prepared a report estimating the amounts and types of wastes expected. This information will be reviewed and verified as necessary and presented in the EIS along with its impacts on landfill design and development.

The Metropolitan Council has requested that Washington County examine three scenarios of waste disposal: 1) acceptance of only mixed municipal waste, 2) acceptance of both mixed municipal waste and ash from mixed municipal waste processing and 3) acceptance of only ash from mixed municipal waste processing. The EIS will incorporate this request and provide the necessary analysis to evaluate impacts.

4. Site layout.

Information from Item (2) will be combined with the site characteristics to develop general site layouts. Items including location of buildings and other facilities, screening, site access and security, limits of the disposal area and monitoring devices will be presented. The visual impacts of facility design are discussed in Section C-4 -Visual Impacts.

5. Clay borrow source investigation.

The use of clay with the proper characteristics for liner construction can be an important feature in the liner design. If adequate clay does not exist at Site G, a search will be made for a clay borrow source following the steps outlined below:

- Review regional soils and geology data
- Review regional siting studies
- Interview drillers
- Identify sites, arrange access
- Site visits
- Backhoe pits, soil samplings
- Soil testing
- 6. Liner design options.

Liner design options will be evaluated and discussed. The compatibility of available soils and synthetic liner materials to expected leachate constituents as determined in Item 12 will be evaluated using existing data. The ability of soil liners to attenuate contaminants will be discussed. The various types of wastes expected will be considered. Optional liner designs, including combinations of soils and synthetics, will be considered. The performance of the materials and designs in existing facilities will be discussed usina available literature. Optional configurations and layouts will be developed and evaluated in terms of performance, constructability and cost. The use of separate disposal areas for different waste types will be considered. Base grade plans will be developed using preferred materials and configurations and considering the constraints identified the hydrogeologic in investigation and the draft MPCA rules. The following will be the primary items discussed:

- Materials evaluation
- Liner design layout
- Base grade plan
- Settlement potential of native soils and the effect on the liner system will be evaluated.
- 7. Liner collection efficiency evaluation.

This evaluation will be conducted using accepted techniques, including Wong's equation and the HELP model to determine liner performance.

8. Final cover design options.

The design of the final cover system will be evaluated in terms of the materials used and the configuration. The effectiveness of soils and synthetic materials in diverting or absorbing precipitation will be discussed. Options for drainage layers within the final cover system will be evaluated.

The ability to maintain a vegetative cover will be evaluated. The need for landfill gas control measures will be evaluated based on the results of the volume estimates in Section D. Landfill Gas Impacts. The performance of various materials and designs at existing sites will be discussed. Various configurations and grading plans will be considered. Design drawings of the final contours and cover design will be prepared. The following are the primary items to be discussed:

- Materials evaluation
- Final grade layout
- Final contour plan
- 9. Final cover performance evaluation.

The effectiveness of the final cover system will be evaluated using water balance calculations, the HELP model, and other appropriate computer models. A discussions of the assumptions used will be provided.

10. Leachate generation analysis.

The volume of leachate generated at each site will vary depending on how much area is operational and how much is under final cover. A sequential analysis based on a conceptual phasing plan will be conducted to estimate the volume of leachate to be expected throughout the operational life and after the site is closed. Information generated in Item 9. will be used.

11. Leachate collection system design.

The leachate collection system is made up of pipes, manholes, tanks, pumps and other items. The design of this system will be discussed in a conceptual manner. Calculations will be performed to determine pipe sizes. Manhole, tank and pump sizing will be based on the leachate generation analysis. A general layout of the manholes and tanks for the site will be prepared. Design details for such items as cleanout access points and leachate removal facilities will be provided.

12. Leachate treatment alternatives.

Leachate collected at a proposed facility will have to be treated. Various treatment options will be evaluated, including on-site treatment, off-site treatment and the impacts on leachate handling. Leachate quality will be determined from existing literature and data from existing landfills. Treatment options will be evaluated based on the expected leachate quality. Technologies for municipal and industrial treatment will be considered. The following are the primary items to be discussed:

- Leachate quality analysis
- Pre-treatment options
- Final treatment options
- 13. Site operations.

Different techniques to handle the expected waste types will be discussed. Operations during adverse weather conditions will be included. The daily and intermediate cover systems will be developed. An Industrial Waste Management Plan and methods to screen municipal waste for hazardous substances will be developed. The nuisance control measures will be discussed in the Section C-7 - Nuisance Factors.

14. End use options.

End use options will be developed in accordance with regional and local requirements. A review of cases where landfills used were for parkland after closure will be conducted.

15. Phased construction sequence.

Conceptual phased development plans will be prepared covering liner construction, drainage, cover, leachate collection and removal facilities and screening. A detailed phase diagram of the first phase of construction will be prepared.

16. Long-term care and maintenance.

Procedures and schedules for maintenance and monitoring of the proposed facility will be discussed. Items include inspection of the final cover and leachate collection facilities and periodic inspection and sampling of the monitoring systems. Requirements for inspection and monitoring in the draft MPCA rules will be discussed. A discussion of the comprehensive site monitoring plan will be provided.

17. Contingency plan.

Situations that require emergency or remedial actions will be identified. Corrective actions will be discussed, including available emergency services such as fire and medical, and remedial actions for spills or releases to air, soil groundwater, surface water or other affected mediums. Concentrations of contaminants that require contingency action will be identified.

18. Earth balance.

Calculations to determine the volumes of excavation, liner materials, cover material, soil for screening and roads required for construction will be performed. Earth-area calculations from crosssections of the site will be used to determine volumes. Detailed calculations will be made for the overall facility and the first development phase. Estimates will be made for additional phases. The need for soils from off-site sources will be noted.

19. Cost estimate.

A general evaluation of the economic potential of landfill gas recovery, based on data generated by the landfill gas hazards section, will be developed for the proposed facility.

Estimates of construction and operating costs will be prepared for the overall facility and the first phase of development. Capital, annual, and per-ton costs will be developed. The following is a list of the major items for which estimates will be developed:

- Land acquisition
- Permit costs
- Facility construction (first phase and total)
 - o Earthwork
 - o Liner materials
 - o Leachate collection and handling equipment
 - o Buildings and roadways
 - o Drainage control measures
 - o Roadway improvements
 - o Utility improvements
- Operations
 - o Labor
 - o Equipment
 - o Insurance
 - o Administration
 - o Inspection and maintenance
 - o Monitoring
 - o Leachate treatment

- Closure
- Long-term care
 - o Inspection and maintenance
 - o Monitoring
 - o Leachate treatment
- Contingency actions
- Financial assurance

Costs will be presented as total capital cost and per-ton to develop a "tipping fee". Costs for identified off-site actions, such as road improvements or additional property acquisition, will be included from other EIS sections to present total development cost.

20. Permit Requirements.

A discussion of the permits required and the level of effort to acquire those permits for the site will be provided.

A discussion of landfill construction certification requirements, which must be met before a site is operated, will be provided.

B. <u>GEOLOGIC AND HYDROGEOLOGIC EVALUATIONS</u>

ISSUES

The permeability of the subsurface materials (soils, glacial materials and bedrock) at Site G and the potential of landfill may pose for groundwater contamination are major concerns. Geologic and hydrogeologic evaluations will be completed to define the geologic conditions associated with the site, and to identify the hydrogeologic conditions and groundwater flow paths and rates associated with the study area. Area water use patterns and water quality information will also be gathered. This information will be used in a evaluation of potential impacts associated with landfill development and operation, including potential movements of potential impacts to groundwater contaminants and supplies. Specific issues will include the following:

- o The vertical and lateral extent of the subsurface geologic deposits beneath the site, including soils, glacial deposits and bedrock.
- The bedrock topography underlying glacial and surficial soils.

- o The physical characteristics (i.e. grain size distribution, soil type) of the subsurface deposits.
- o The continuity and variability of the subsurface deposits.
- o The water level elevations and groundwater gradients at the water table and within the deeper aquifers at the site.
- o Identification and definition of continuing layers and confined and unconfined aquifers.
- o The vertical gradients of groundwater through confining layers.
- o The horizontal and vertical permeabilities, including in-situ tests, of the subsurface units.
- The hydraulic continuity of the confining layers at the site.
- o The relationship between the local groundwater flow system and the regional flow system. [The field data obtained and other available data will be reviewed to determine as closely as possible the extent of the regional flow system].
- The surface water/groundwater interactions of the area.
- The area water use, by both domestic and high capacity water wells.
- o The potential migration pathways for contaminants.
- o Background groundwater quality at the site.
- Water level data will be reviewed and the effect of extreme water level conditions considered in analyzing groundwater gradient and potential contaminant pathways.

REQUIRED STUDIES

The workplan for the geologic and hydrogeologic evaluations will be organized into a sequence of tasks most suited to conditions at Site G. The sequence includes a phased approach, in which specific tasks will be completed and the data evaluated before additional tasks are started. This approach allows revisions in the workplan to be made in order to enhance the quality of the data collected. The following is a description of the major tasks for which data will be gathered to evaluate the issues listed above. They do not reflect the order in which they will be completed.

1. Area well search.

An area well search will be completed to identify the area water use patterns and potentially impacted water supplies. The search will include collection of well information from the Minnesota Department of Health (MDH) and the Minnesota Geologic Survey (MGS) files and surveying of residential and industrial water users within 1 mile of the boun-High capacity wells (greater dary of the site. than 1,000,000 gallons per year or 10,000 gallons per day) within 3 miles of Site G will also be identified. An attempt will be made to locate wells for which no record exists. The potential for the construction of future wells will be identified.

A preliminary area well survey has been completed as part of the EAW activities. This telephone survey, conducted by Genereux Social Science Research, identified water use and well characteristics within 1/4-mile of the site. The EIS area well search will build upon the preliminary survey.

2. Soil borings.

Soil borings will be completed at the site to provide information on site stratigraphy and the geologic, hydrogeologic and geotechnical properties of subsurface materials.

Soil borings will utilize standard geotechnical procedures including hollow stem augering, split spoon sampling, thin wall sampling, and geotechnical testing. Boring locations will be selected based on existing site information and geophysical data. Criteria on which drilling locations will be based include: Providing areal coverage, distributing borings over various topographic features, investigating of geophysical anomalies and verifying of geophysical data. Soil borings will be drilled in conjunction with the deepest well at each well cluster or well location to identify the geologic and geotechnical conditions at each well site. Additional soil borings will be completed in select areas across the site not associated with well construction. These borings will provide better site coverage regarding geologic and hydrologic conditions and will assist in site assessments and preliminary landfill design.

3. Water Table piezometers.

Piezometers will be installed to measure the static level of water in the water table. Piezometers are small diameter wells which are used for water level determination only. They will be installed in the lower elevation areas of the site where the water table is within the surficial clayey deposits. The piezometers will assist in establishing the hydraulic relationship between the water table within the clayey deposits and the granular water table aquifer. The piezometers will be installed using standard geotechnical procedures including hollow stem auger and split spoon sampling.

The piezometers will be installed using standard geotechnical procedures including hollow stem auger.

4. Water table wells.

The purpose of wells installed in the water table aquifer is to identify the lateral gradients at the water table and the vertical gradients to deeper aquifers. Selected water table wells will be sampled to provide information on background water quality. The wells will be installed using standard geotechnical procedures including hollow stem augering, spit spoon sampling, and thin wall sampling. Water table wells will be installed adjacent to 2 bedrock wells and adjacent to each intermediate well to form two-well clusters. Additional water table wells will be installed across the site to investigate the varying topographic features of the site.

5. Intermediate wells.

Intermediate wells will be installed in either the lower sections of the water table aquifer or within the buried outwash aquifer (if present) as determined during drilling. The purpose of intermediate wells is to provide information regarding flow directions and rates in the lower section of the water table aquifer or within the buried outwash aquifer (if encountered). Selected intermediate wells will be sampled to provide information on background water quality. This information will help assess glacial unit/bedrock interactions. The wells will be installed using procedures similar to those described in the water table wells section. Two intermediate wells will be installed adjacent to bedrock wells, forming a three well cluster. Additional intermediate wells will be distributed across the site to provide areal distribution, investigate or provide ground verification for geophysical information and provide information on ground water movement.

6. Deep wells.

The purpose of bedrock wells is to establish vertical gradients to the deeper aquifers, and depth to bedrock. Selected bedrock wells will be sampled to provide information on background water quality. The wells will be drilled using either hollow stem augering and bedrock coring or rotosonic drilling procedures. Mud rotary or air rotary techniques may also be utilized.

7. Soil sampling.

The purpose of soil sampling and testing is to provide data on the various geologic strata and materials underlying the site. Selected soil samples will be analyzed by a geotechnical laboratory for grain size distribution (both mechanical and hydrometer), Atterburg limits and permeability. This data will provide the information necessary to identify the nature of the sediments and to calculate representative aquifer flow rates. Permeability and grain size testing will be completed on the granular deposits as well as the glacial tills at the site. 8. Geophysics.

- Downhole Survey.

Downhole geophysical procedures will be conducted to enhance the data base used to define the site geology. Downhole geophysical procedures measure the in-situ properties of the subsurface materials and are invaluable in defining material characteristics and geologic contacts.

The procedures (electric logging and/or gamma logging) will be conducted at each drilling site. Electric well logs consisting of electrical resistivity and spontaneous potential will be conducted in mud rotary boreholes and within the open hole drilled into the bedrock. Gamma logs will be conducted on all completed well sites and in the soil borings not associated with well construction.

Resistivity survey.

Surface electrical resistivity procedures will be used to identify the conductive nature of the subsurface deposits and to define their physical characteristics. This information will be used to correlate stratigraphic geologic trends between boreholes. Electrical resistivity procedures will employ the use of the Bison Boss System and its attendant method, to measure the lateral and vertical variations across the site.

A preliminary electrical resistivity survey which was conducted as part of the EAW is summarized in a memo attached to the EAW.

- Seismic survey.

A seismic survey will be used to assist in identifying the nature of the subsurface deposits and to define the depth to the uppermost bedrock surface. The seismic survey results will be used to complement the findings of the resistivity surveys and the test drilling procedures.

9. Water quality sampling.

Groundwater samples will be collected from selected wells in the various aquifers to determine the water quality at Site G. An initial sampling plan would include parameters which are indicative of background water quality in a general way. These would include several physical characteristics such as temperature, pH, turbidity and specific conductance and selected chemical parameters such as screening for total organics (TOX) and selected cations and anions. The parameter list will be determined through discussions with the MPCA and Washington County during the EIS phase.

10. Water level readings.

Water level measurements will be collected in the wells at each site on a periodic basis. At selected wells, automatic water level recorders will be installed to monitor continuous water level trends. Water levels will be measured to the nearest 0.01 foot using either a steel tape or a calibrated M-Scope.

Gauging stations will also be installed at Eagle Point Lake and in selected on-site and adjacent wetland areas (if necessary). Lake and wetland levels will be measured on the same frequency as the groundwater levels referenced above.

11. Data reduction and analysis.

The data collected will be analyzed and presented in written and graphic form to describe site conditions. All supporting data will be presented in appendices to the EIS.

12. Review of existing landfill contamination data.

A review of existing data regarding any contamination history resulting from landfills of similar design will be conducted. Available data regarding any contamination associated with the Lake Jane and Oakdale Landfills will be reviewed. The information will be summarized, referenced and used in determining potential releases and impacts associated with landfill development.

The output will include:

- o Area well survey results and location maps.
- o Geophysical results and geophysical maps.
- Soil boring location maps, well and boring logs, geophysical logs, and geotechnical testing results.

- o Geologic assessment; including geologic cross sections.
- o Groundwater and lake level data.
- Hydrogeologic assessment; including 0 groundwater gradient (potentiometric) maps, hydrogeologic cross sections, vertical gradients, representative permeabilities and flow rate calculations, surface water/groundwater relationships, and water quality results.
- Preliminary impact assessment of potential 0 impacts associated with landfill development; including an analysis of all the data gathered to prepare a detailed description of geologic and hydrologic conditions. Based on this analysis, conceptual the design and anticipated waste characteristics, an the potential impacts of assessment of development landfill will be prepared. Potential contaminants that could be released will be identified. The migration pathways under and around the site, and the velocity at which contaminants can move, will be discussed. The groundwater aquifers, water supply wells and surface water bodies that may be impacted will be identified.

C. <u>SURFACE WATER IMPACTS</u>

ISSUES

The EIS will evaluate landfill impacts on surface waters, including Eagle Point Lake, Lake Elmo, downstream waters, including the St. Croix River, and existing drainage systems. Specific issues include:

- Impact of runoff and leachate and airborne contaminants on the water quality of the lakes, wetlands and shorelands, including the consideration of chemical composition and nutrient loading.
- Effect of filling or draining on reduction of runoff storage capacity.
- Sedimentation and erosion impacts on Eagle Point Lake, Lake Elmo, wetland areas, existing drainage control features, the Valley Branch Watershed 509 drainage project and the St. Croix River.

o Mitigative measures and potential costs.

REQUIRED STUDIES

1. Calculate site runoff.

Standard Soils Conservation Service methods will be used to determine runoff from the proposed facility. The expected final contours and planned drainage patterns will be the basis for the determination.

2. Evaluate sedimentation and erosion impacts.

The estimated sedimentation transport and erosion impacts due to the calculated runoff will be evaluated. Impacts on Valley Branch Watershed District Project 509 and natural surface water bodies, including wetlands and Eagle Point Lake, will be considered.

3. Evaluate water quality and quantity impacts of runoff, leachate and ash.

Impacts to surrounding surface water bodies due to the calculated runoff and sediment volumes will be evaluated. Potential nutrient loading and chemical contamination due to leachate, or ash release, or surface water treatment will be discussed.

4. Base Flood Elevation

Determine the 100-year base flood elevation of Eagle Point Lake and present methodology used to do so.

5. Evaluate mitigative measures.

Measures to mitigate impacts to surface water bodies will be discussed, including erosion control measures, conceptual sedimentation pond design, control of surface water during operation and temporary measures used during phased development of the facility. Potential conflicts with the Valley Branch Watershed District plan and Metropolitan Council policy will be identified. Requirements of the draft MPCA rules for surface water control will be considered. The potential costs of mitigation measures will be estimated.

D. LANDFILL GAS IMPACTS

Gases are released from the waste and as a result of the biological breakdown of organic materials. The analysis in this section will address the impacts in close proximity to the facility. Off-site effects will be addressed in Section C-5 - Air Quality Impacts.

ISSUES

- o The potential impacts of human exposure to landfill gas on-site. The effects of methane and trace organic gases (such as benzene and vinyl chloride) will be discussed.
- o The potential hazard of explosions.
- The potential impacts on vegetation near the proposed landfill.

REQUIRED STUDIES

 Identify landfill gas volume and migration pathways.

Data on soils and wind patterns will be used to determine migration pathways.

 Identify potential atmospheric concentrations of gas on-site. This information will be used in Section C-5 - Air Quality Impacts - to determine off-site effects.

Effects on workers will be evaluated, including toxic and explosive potential. Off-site effects will be evaluated under Section C-9 - Health Risks of Potential Pollution.

3. Evaluate potential impacts of migration of gas through the soil.

Impacts on surrounding vegetation and the potential for gas to accumulate in underground structures, or along buried utilities or buildings will be studied. 4. Evaluate mitigative measures.

Measures to control the migration of landfill gases will be discussed with relation to the potential decrease in concentrations experienced by receptors. The cost of mitigation will be estimated.

5. Monitoring plan layout.

A conceptual landfill gas monitoring and control plan, as required by state and county regulations, will be prepared, detailing monitoring locations and devices.

E. FLORA AND FAUNA

The scope of this task will include the inventory and assessment of impacts on plant and wildlife communities. The EIS will address specific areas of concerns. and measures to reduce impacts.

ISSUES

The DNR has completed a biological survey of Washington County. An on-site field review was conducted as discussed in the EAW. No sensitive plant species were located within the proposed site boundaries within that short field review.

The EIS will include detailed field studies of existing flora and fauna. Based on preliminary designs prepared for the EIS, the impacts of the proposed project on flora and fauna will be quantified. Specific issues to be addressed include:

- o Impacts on habitat potential.
- o Impact on lakes and wetland.
- o Wildlife impacts.
- o Chemical exposure potential and impacts.
- o Impacts on restored prairie.
- o Impacts on natural community potential.
- o Mitigation measures and potential cost.

REQUIRED STUDIES

1. Habitat potential.

The DNR has compiled a list of sensitive plant and animal species known from the general area which have habitat requirements that may be met by habitats available in the park. A one day site review conducted at a later date by a DNR biologist did not locate any sensitive plant species within the proposed site boundaries. Further field surveys will be conducted in cooperation with the DNR to determine if any habitat conducive to sensitive plant and wildlife species exists at Site G. Any such areas will be mapped and identified.

2. Restored prairie, wetlands and woody species.

The proposed project would remove approximately 43 acres of a 73 acre restored prairie. Approximately 8 acres of woody species and 1 acre of wetland would be removed by the proposed project. The effect of these depletions on habitat potential and wildlife will be discussed in the EIS.

3. Natural community analysis.

The DNR field review indicated some potential for natural communities exists within the proposed site boundaries. Field surveys and the examination of aerial photographs will be used to determine if any natural communities exist and the quality of any Any natural communities identisuch communities. fied will be mapped. Available water level records for Eagle Point Lake both prior to and after the 509 project will be completion of the VBWD impact of water levels on native reviewed. The vegetation/natural communities along the Eagle Point Lake will be analyzed and included in the discussion of natural communities.

4. Wildlife movement

The impact that the construction of the landfill would have on wildlife movement will be discussed in the EIS.

5. Impacts on lakes and wetlands.

The impacts of landfill development on the habitat potential of lakes and wetlands will be determined, especially regarding the use of Eagle Point Lake as a fish hatchery (refer also to Section C-1 -Surface Water Impacts). This will include direct impacts of filling, draining or altering wetlands or watersheds. Indirect impacts of runoff and/or leachate on the chemical make-up or nutrient load on Eagle Point Lake, Lake Elmo, downstream waters, including the St. Croix River, and/or wetlands will be determined. 6. Chemical exposure.

The potential for chemical exposure and any related impact on wildlife and waterfowl will be addressed.

7. Mitigative measures.

Methods to mitigate the impacts on plant or animal species will be discussed, including the creation of new habitat, transplanting plant species, and other methods. The potential costs of mitigation will be estimated.

F. VISUAL IMPACTS

ISSUES

- Visual impacts which would be experienced by park users and adjacent landowners.
- o Delineation of visual impact areas.
- o Appearance of site facilities.
- Development of mitigation measures and the estimated cost of mitigation.

REQUIRED STUDIES

1. Photographs of site.

The EIS will include photographs of Site G with a minimum of two landfill designs marked on them.

2. Artistic rendering(s).

Artistic rendering(s) of the landfill design will be developed for inclusion in the EIS.

3. Visual impact assessment.

Several targets, such as weather balloons, would be set at the final elevation of the closed facility to determine the extent to which the facility would be visible. Photographs will be taken of the balloons from selected locations including, at least, all four compass directions. The impact of the proposed landfill on existing landforms would also be considered in the EIS. The landfill would artificially alter the appearance of the landscape. 4. Mitigation measures.

Mitigation measures such as visual screening with native vegetation and landfill design to minimize visual impact and an estimate of associated costs will be included in the EIS.

G. <u>AIR QUALITY IMPACTS</u>

ISSUES

Air quality impacts may be experienced on-site, adjacent to the site and along hauling routes. The EIS will evaluate the following:

- Type, magnitude and frequency of emissions (vehicle exhaust and dust including airborne ash) or odors (from waste or from landfill gas). The impacts of landfill gas are addressed in Section C-2 - Landfill Gas Impacts.
- Areas that may be impacted by airborne contaminants. These include areas around the site and along hauling routes.

REQUIRED STUDIES

1. Traffic exhaust.

Computer modeling and local wind data will be used to predict increased levels of exhaust along expected hauling routes. Wind data (i.e. a wind rose) from the Lake Elmo Airport will be used.

2. On-site equipment exhaust.

Computer modeling and local wind data will be used to predict exhaust levels downwind of the landfill site.

3. Dust and odors from operations.

The volume of dust generated by landfill operations will be predicted. The effects of odors and release of landfill gas off-site will be discussed. Impacts on receptors will be evaluated. 4. Leachate handling and treatment.

The methods of leachate handling and treatment and the resulting impacts will be discussed. Airstripping (forced evaporation) of volatile organic compounds is a possible treatment option that could impact air quality.

5. Mitigative measures.

Methods to mitigate the impacts on air quality and an estimate of the associated costs will be discussed, including dust and gas control measures and methods to reduce exhaust emissions.

H. NOISE IMPACTS

ISSUES

Noise impacts may be experienced on-site, adjacent to the site and along hauling routes. The EIS will evaluate the following specific issues:

o The potential for and impacts of increased noise levels due to construction, operation and hauling on critical receptors.

REQUIRED STUDIES

1. Identify critical receptors.

The Park Reserve, homes, businesses, schools, or other facilities expected to be most impacted will be identified.

2. Existing noise levels.

Ambient noise levels at Site G and selected critical receptors will be recorded. Sound level meters will be used to determine average and peak sound levels.

3. Traffic noise.

Computer modeling using the STAMINA 2.0 FHWA model will be used to predict the increase in noise levels along expected hauling routes. Noise measurements along selected haul routes will be made to assist in model calibration. 4. On-site equipment noise.

Procedures developed by the Federal Highway Administration will be used to predict noise levels from on-site equipment. Noise measurements will be made at the site to supplement the noise modeling work.

In cooperation with Washington County Park Department, noise level readings will be taken at selected areas within the Park Reserve while heavy equipment, similar to that used in landfill operation, is operated at the proposed site. This information will be used to aid in analysis of noise impacts on the Park Reserve.

5. Mitigative measures.

Measures to mitigate noise impacts and an estimate of associated costs will be discussed, including limiting hours of operation and construction of noise barriers.

I. NUISANCE FACTORS

ISSUES

The EIS will evaluate the potential of nuisance impacts including litter, birds and rodents.

REQUIRED STUDIES

1. Evaluate potential for litter.

Comparisons to existing landfills will be used to evaluate potential impacts on areas proximate to the site, including the airport and haul routes.

2. Evaluate bird hazard.

Available data from existing landfills will be used to evaluate the potential bird hazard.

3. Evaluate potential for rodent problems.

Comparisons to existing landfills will be used in this evaluation.

4. Develop mitigative measures.

Methods to mitigate the impacts of nuisance factors and an estimate of associated costs will be discussed.

J. TRAFFIC

The EIS scope of study will be to evaluate landfillinduced traffic impacts related to the proposed facility. Impacts resulting from hauling of waste, leachate, construction equipment, liner material, and cover material will be assessed. The traffic study will assess impacts in the context of pedestrian safety, vehicular safety, roadway design, mitigative measures, associated costs, and impact on transportation plans. Surrounding roadways will be studied with the goal of identifying routing alternatives. Any noise impacts associated with traffic along hauling routes are addressed in Section C-6 Noise Impacts.

ISSUES

Landfill-generated traffic impacts will be evaluated. Specific impacts which will be analyzed include the following:

- Origin and anticipated routing of traffic to and from the landfill site.
- o Prediction of traffic volume.
- Impact on roadway capacity and quality of traffic operations.
- o The impacts of the projected traffic volumes on the structural capacity of the existing pavement.
- o The impact of truck traffic on Lake Elmo Regional Park Reserve users, bicyclists, pedestrians and existing and future residential areas.
- o Safety hazards resulting from potential landfill development.
- o Type and extent of roadway improvements required and estimated costs.

o Mitigative measures and an estimate of associated costs.

REQUIRED STUDIES

1. Trip generation analysis.

Estimate number of truck trips and types of trucks expected to/from waste processing facilities and other waste sources, as well as for hauling clay or other cover and operational materials and other traffic generated by site construction and operation.

2. Trip distribution analysis.

Develop likely routes and timing of trips for trucks to/from the proposed facility.

3. Route definition, highway classification and construction profile.

Evaluate capacity, load limits, and geometric features of roads along anticipated routes. Identify items critical to safe and efficient travel to/from the proposed landfill facility, such as inadequate pavement strength, intersections at or near capacity, or insufficient traffic control devices.

4. Accident analysis.

Identify safety hazards to vehicles, bikers and pedestrians along the proposed routes based on accident history analysis and existing traffic patterns. Evaluate impacts of landfill facility traffic on these hazardous areas.

5. Traffic counts at critical intersections.

Existing traffic counts will be analyzed. Traffic counts will be performed at up to three critical intersections to develop current Average Daily Traffic and Peak Hour values at critical intersections, as necessary.

6. Traffic forecasting.

Develop forecasts of future traffic volumes along anticipated routes, including anticipated traffic to the proposed facility. 7. Capacity analysis.

Critical intersections will be analyzed from a capacity standpoint for both existing traffic volumes and projected traffic volumes as a result of the proposed landfill facility. The capacity analyses will follow the procedures outlined in the Transportation Research Circular, number 212, January 1980.

8. Develop optional routes.

Based on the results of item (3) through item (7), optional routes will be investigated in an effort to improve routing to and from the proposed landfill facility.

9. Discuss possible road improvements and develop cost estimates.

Final recommended routes will be specified and inadequacies in geometrics, pavements and traffic control devices will be identified, along with recommended improvements and cost estimates for implementation.

K. <u>HEALTH RISKS OF POTENTIAL POLLUTION</u>

ISSUES

Possible risk to human health should a release of contaminants into air or groundwater, surface water or soils occur.

REQUIRED STUDIES

1. Description of analysis techniques.

A discussion of the techniques for conducting the analysis and their applicability to the project will be prepared.

Data generated from the hydrogeologic investigation on groundwater flow patterns and velocities, along with an analysis of wind patterns, will be used to identify critical receptors of contaminants potentially released into groundwater or the atmosphere. Critical receptors are groundwater users or residences, schools, businesses or other permanent facilities that would be exposed to the highest possible levels of contaminants for long periods of time. 2. Attenuation of groundwater contamination.

An analysis of the capacity of the soil liner and native soils to attenuate contamination will be conducted to help predict the concentrations of potential contaminants that groundwater users could be exposed to.

3. Atmospheric dispersal.

An analysis of dispersal mechanisms in the atmosphere will be used to predict the levels of airborne emissions such as ash, landfill gas (i.e. methane, vinyl chloride, etc.) and other gaseous emissions experienced within the impact area.

- 4. Chemical Exposure of waterfowl and fish. The potential for chemical exposure and contamination of waterfowl and fish and to humans consuming fish as a result of surface water contamination will be evaluated.
- 5. Analysis of human health risk.

The above information will be used to evaluate the potential risk to human health in terms of toxic effects and changes in the risk of cancer and other diseases. Health risk analysis techniques will be reviewed and their limitations discussed.

L. ARCHAEOLOGICAL/HISTORICAL RESOURCES

The EIS will ascertain points of archaeological and historical significance, determine the extent of impacts of the proposed landfill, outline mitigative measures, and determine potential costs of mitigation if appropriate.

ISSUES

In accordance with recommendations from the State Historic Preservation Officer (SHPO), scope items under this heading will include the following:

- o Location of any on-site archaeological properties.
- o Mitigation measures and potential cost.

REQUIRED STUDIES

1. Archaeological Survey

The SHPO has no record of reported historic or prehistoric properties on-site. There is a good probability that unreported archaeological properties may be present near the shore of Eagle Point Lake. Surveys in other parts of central Minnesota have shown that prehistoric sites are commonly found along the shoreline of lakes and wetlands. The site will be surveyed by a qualified archaeologist for archaeological properties.

2. Mitigative Measures.

Methods to mitigate the impacts on any significant resources and an estimate of associated costs will be discussed.

M. LAND USE

The EIS will present a comprehensive study of the impacts to existing and future land uses in the candidate site environs.

ISSUES

The EIS will evaluate landfill-related land use impacts on developers, existing home owners, and other existing property owners. Impacts on land use planning will be evaluated. Specific scope items will include the following:

- o Effect on continued use and enjoyment of residential land within the impact area in Lake Elmo, and to a lesser extent Oakdale. The area is bounded by Minnesota Highway 5 on the north, I-694 on the west, I-94 on the south and County Road 17 on the east. A sampling of residents of Lake Elmo on the eastern side of the lake will be included in the interviews.
- o Effect on the City of Lake Elmo and to a lesser extent Oakdale and Woodbury comprehensive land use and zoning plans and long range community goals.

- Effect on compatibility and consistency of end use with local comprehensive land use and zoning plans and long range community goals.
- o Impact on future development of the Lake Elmo Park Reserve.
- o Impact on preferred development of undeveloped agricultural or vacant land.
- Impact on existing or planned municipal facilities.
- o Impact on development of other utility and non-utility municipal services.
- o Impact on agricultural land use.
- Impact on safety of groundwater resources for potable uses. This will build on Section B -Geologic and Hydrogeologic Impacts.
- o Mitigative measures.

REQUIRED STUDIES

The EIS will include a thorough review of the future impacts of development of the site on land use. The research will include:

- 1. Review of current public and private land use plans with and without the landfill as contained in the initial land owner interviews and discussions with land use officials. Additional follow up interviews will be done as necessary.
- 2. Comparison of these plans and concerns with results from comparative areas.
- 3. Impact on municipal services based on tax revenue effects and increased demand for safety and utility services caused by the landfill operation.
- 4. Impact on future development of the Lake Elmo Park Reserve.
 - Estimate changes in use of park reserve due to landfill development based on interviews and use data.

5. Impact on agricultural productivity.

The productivity of agriculture in the vicinity of the site will be evaluated. The secondary economic effects of this production in the supply and service economies will be calculated.

- 6. Impact on prime agricultural land in the City, based on owner plans and changes in land use development dynamics as those forces might be affected by a landfill siting.
- 7. Mitigative measures.

Mitigation measures and their potential costs will be evaluated.

N. PARK RESERVE USE/PARK RESERVE PLANNING IMPACTS

The extent of both direct and indirect impacts on Lake Elmo Park Reserve will be evaluated.

ISSUES

- Impacts of loss of passive recreational use (i.e., hiking and equestrian trails, nature observation, restoration of ecosystem) in vicinity of proposed site development.
- o Impacts of reducing access to much of the southwestern portion of the park by disrupting the trail system.
- Impact on Park Reserve potable water supply which will build on Section B - Geologic and Hydrogeologic Impacts).
- Water quality, filling and biological impacts on lakes and wetlands (This will expand on information obtained in Section C-1 - Surface Water Impacts).
- Impacts on both natural and restored biological communities within the Park Reserve, including aquatic communities (This will utilize information from Section C-1 -Flora and Fauna).
- o Impacts on Park Reserve operations.

- o Identification of critical Park Reserve usage receptors, such as the new group and family camping areas and the determination of the extent and level of visual, noise, traffic and nuisance impacts on receptors.
- o The indirect impacts that Park Reserve users' image of the Park Reserve as a whole may have on their enjoyment and use rates in portions of the Park Reserve not directly impacted by landfill construction.
- Impact of the proposed landfill on regional financial investments made to date in the Lake Elmo Regional Park Reserve, including the level of investment needed to replace/restore past regional investments made "less serviceable" by the development of a landfill.
- o Mitigation measures and their potential cost.

REQUIRED STUDIES

1. Park development and operations.

Analyze the direct impacts of landfill development on existing and planned Park Reserve development and operations. This will include discussions with County park planners and consultation of the Park Reserve Development Plan.

2. Plants and wildlife.

Evaluate impact on natural and restored plant and animal communities and special species (Refer to section C-3 - Flora and Fauna).

3. Critical receptors.

Identify critical receptors and level of impacts on these receptors.

4. Aesthetics.

A preliminary discussion of visual impacts is included in the EAW. The EIS will more specifically identify visual impact areas and impacts (refer to Section C-4 - Visual Impacts). 5. Impacts on park users.

Research into the effect of landfills on recreational land uses will be used to set research methodologies for detailed EIS research. Such research will include interviews with Park Reserve users who would likely be able to observe and/or know about the landfill and its operations.

6. Loss of parkland on Park Reserve service area.

Evaluate the effect of the loss of parkland on other similar parkland usage within the service area.

7. Mitigation measures.

Mitigation measures and their potential cost will be discussed which would minimize impacts, including visual screening, habitat replacement, native plantings and potential changes in Park Reserve development [and loss of parkland].

- 8. The EIS will address the impact of the proposed landfill development on regional financial investment made to date in Lake Elmo Park Reserve.
- 9. The EIS will address what level of future investment will be required to replace/restore past regional investments made "less serviceable" by the development of a landfill at Site G.

O. MUNICIPAL GOVERNMENT ISSUES

The proposed site is within the City of Lake Elmo. Given the proximity of site borders to those of other municipalities, secondary impacts are possible considerations for the planning authorities of the Cities of Oakdale and Woodbury in Washington County. Issues include the effect of site development on the community and the costs to local government. Costs of mitigation measures will be addressed as an element in estimating landfill development costs (Section C-11 - Cost Estimate). Potential costs and benefits to the community and residents will be included in the determination of net impact.

ISSUES

The following planning, fiscal, and infrastructure management issues will be examined:

- o The effect of site development on fulfillment of Comprehensive Plans now in force which affect land use within the site area.
- o The potential for site development to pressure the City of Lake Elmo into an accelerated pattern of residential and commercial growth.
- Costs to the City of Lake Elmo to monitor the construction and operation of the proposed landfill.
- Tax implications of any reduction in the value of residential and commercial properties in service or planned within the impact area of the proposed site.
- o The effects of site construction and operation on social overhead (e.g. roads and emergency services such as fire, law enforcement and ambulance services).

REQUIRED STUDIES

- 1. The EIS will review the level of difficulty faced by Lake Elmo in dealing with the Lake Jane landfill, especially the level of effort and associated costs and attention paid to dealing with that situation by staff and elected officials alike. Inter-governmental problems with county, metropolitan, and state agencies will be reviewed and their probability of reoccurrence estimated.
- 2. The response in zoning or development decisions in that instance will be reviewed as well.
- 3. A comparative study of the ability of municipalities to attract desirable residential growth with and without landfills will be used to gauge overall community effects.
- 4. Following an estimate of the loss or gain of property value from landfill development, the tax base and tax losses will be estimated.

P. <u>SOCIO-ECONOMIC IMPACTS</u>

The study efforts will be oriented to determining socioeconomic impacts associated with landfill development including assessment of the direct and indirect effects on local agricultural, residential, commercial and industrial development and impacts on property values. Impacts will be evaluated as a function of distance, when appropriate.

ISSUES

The following issues will be addressed in the evaluation provided by the EIS. Issues include both social impacts and impacts on the economics of private landowners.

- o The development of a landfill within the borders of a small municipality has the potential to cause social disruption, to realign established neighborhoods, and to change the perceptions residents share about the character of the city. The following issues will be examined to determine the likelihood that site development will affect these outcomes:
 - Changes in the demographics of Eagle Point Elementary School.
 - The potential for out-migration of residents from the impact area of the site.
 - Anticipated changes in the quality of life or rationale for which local residents chose to live in the area.
 - The effects of future landfill development processes on the public's view of regional planners, guarantees for safety and the authority of local planners and planning ordinances.
- o Impacts of the costs and benefits of site development will be examined for:
 - Owners of residential property, both developed and undeveloped.
 - Owners of specific commercial enterprises.

- Owners of wells who may have direct water contamination, and the indirect effects of anxiety, financial loss and fear of financial loss.
- o Mitigation measures and their potential cost.

REQUIRED STUDIES

The following is a list of likely required research:

- 1. Estimates of out-migration based on interviews and comparative site research.
- 2. Estimates of the cost to residents of relocation due to out-migration.
- Estimate of the percent of residents whose values 3. inherent in the choice of Lake Elmo will be lowered landfill development. the These are, by especially, their relationship with the natural environment of the Park Reserve and their neighborhood values.
- 4. Potential for significant raising or lowering of civic involvement by local citizenry, based on leadership analysis.
- 5. Potential for diminishment of neighborhood life based on sociograms referenced to existing neighborhood values.
- 6. The probability of significant social or psychological disruption will need to be investigated by interviewing of persons who appear to be at a significant risk. The initial analysis of the interview indicates this will not be extensive.
- 7. Estimates of the health costs associated with severe psychological disruption.
- 8. A hedonic value analysis, which measures the effect a disamenity or amenity has on the future development on nearby property. Existing land and other property values will be studied as the baseline for this analysis.

-40-

- 9. Based on interviews and such similar situations as can be found in the secondary literature, an estimate of the effect on commercial developments such as the proposed Wooddale Mall and the local airports will be estimated.
- 10. Review costs and public policies in cases where well contamination has occurred. If necessary, do primary research to determine response of public officials and evaluation of success of remedial actions, mitigations and compensations.
- 11. Mitigative measures.

The impacts identified will be analyzed and mitigation measures evaluated. Measures used at existing sites will be studied, as will measures used in other land use controversies, as appropriate. The research will follow the steps outlined below:

- Impacts identified and predicted will be tabulated and classified for each site according to a standard format.
- Research on mitigation measures in other areas will be conducted.
- Costs of mitigation measures as part of landfill development will be estimated.
- A description of alternate County or Metro policies to deal with identified impacts.
- Approximate costs of mitigation in the environmental setting of Site G.

Q. <u>AIRPORT IMPACTS</u>

ISSUES

The Lake Elmo Airport is outside the limit at which a landfill is considered a conflicting use. The impacts of landfill development on ultralight and balloon enterprises will be evaluated.

R. <u>LEGAL ISSUES</u>

ISSUES

 The legal ramifications of developing a landfill within the Park Reserve.

REQUIRED STUDIES

- Evaluate legal authority, indirect effects and precedent setting results of using Site G for landfill rather than park purposes.
- Evaluate if the restrictive covenant which Site G is presently subject to precludes the use of Site G as a landfill.
- 3. Determine if the restriction can be waived by the Metropolitan Council.
- 4. Determine if the Metropolitan Council has the authority to unilaterally waive the restriction and consent to the use of the site as a landfill or if they only have authority to respond to requests to waive a particular restriction and consent to a particular use.
- 5. Determine if the use as a landfill of that portion of Site G which is located in the Lake Elmo Park Reserve is prohibited because of restrictions on the use of the park included in grants received by Washington County which were used to purchase a portion of the Lake Elmo Park Reserve property, but not the specific property included in Site G.

VI. <u>ALTERNATIVES</u>

ISSUES

The Metropolitan Council, acting under the mandate of the Minnesota Waste Management Act, has determined that Washington County should select a site suitable for the development of a 2,494 acre-foot mixed municipal waste landfill. The requirement is set forth in the Metropolitan Solid Waste Management Development Guide/Policy Plan, issued in March, 1985. One site, Site G, has been determined to be intrinsically suitable by the MPCA and is the only site in Washington County's landfill site inventory.

Development of Site G will comprise the "action" alternative in the EIS. The Metropolitan Council has requested that Washington County analyze three scenarios for waste disposal: 1) mixed municipal waste only, 2) both mixed municipal waste and ash from mixed municipal waste processing and 3) ash from mixed municipal waste processing only. The EIS will evaluate these scenarios in the "action" alternative. A second alternative, a "no-action" alternative, will be addressed. This alternative will consist of not developing a 2,494 acre-foot landfill at Site G.

A third alternative will also be addressed that is related to the development of private landfills. The EIS will identify existing or future private capacity that could potentially reduce the need for a new landfill. This portion of the study will be coordinated with the Metropolitan Council.

In addition to the three alternatives mentioned above, the EIS will discuss several issues related to alternatives to landfills, but will not present them as alternatives to Site First, the EIS will discuss the effect of public and G. private resource recovery facility development on landfill volume needs and waste types. Second, the EIS will discuss the impacts of existing and planned waste abatement programs, including waste reduction, recycling and composting on waste volumes and waste types. Third, the EIS will present a general discussion costs of landfilling, resource on Alternatives for recovery, composting and recycling. landfill abatement considered or implemented in county solid waste plans and alternate uses of RDF facility residuals and resource recovery ash will be considered in terms of their impacts on potential waste types and quantities. All of this information, in turn, will be examined in terms of its impact on landfill development and design.

REQUIRED STUDIES

The alternatives will be analyzed using data from the Metropolitan Council and other metropolitan counties. The issues related to alternatives, ie., waste abatement methods and cost analyses, will be prepared using existing plans, reports and studies by the Metropolitan Council and the County, as well as the various studies currently in progress by the County.

Minnesota Statutes Section 473.833 subd. 2a limits the alternatives that the County can consider in the EIS. The issue of alternatives to landfills is not an issue which should be considered in the EIS; only other land disposal alternatives specifically allowed in the law are to be considered. Landfill abatement methods, such as recycling, composting, waste reduction and resource recovery, have been evaluated and considered by the Metropolitan Council in determining needed land disposal capacity in its Solid Waste Policy Plan. Washington County will analyze the decisions made by the Council with regard to regional land disposal The EIS will, however, examine the capacity in the EIS. system as proposed by the Council as it could effect the proposed landfill.

The Metropolitan Council will supply its estimates of disposal requirements from all the inventory sites. The County will provide a review of the detailed research and analysis procedures during the EIS phase. The EIS will incorporate the Metropolitan Council findings that result.

The EIS will estimate the overall economic cost of the landfill, including impact mitigation costs, in order to provide a comparison between cost and need.

VII. <u>PERMITS</u>

This EIS pertains to the siting of a landfill, not to the construction or operating permits for a landfill at a a particular site. Therefore, in accordance with Minnesota Statute 473.833, Subd. 2a, the EIS will address matters respecting permitting only to the extent necessary for the siting decision to be made. Necessary permits will be identified. Permits for which a record of decision will be required include those from the MPCA, the Metropolitan Council and the County and others, as appropriate; but these records of decision will not be developed as part of the siting EIS. Permits which may be necessary and which have been identified at this time include:

LEVEL OF GOVERNMENT

TYPE OF APPROVAL NECESSARY

| Federal: | U.S. Army Corps of Engineers | Section 404 Permit Fill of U.S. Waters |
|---------------|--|---|
| <u>State:</u> | Minnesota Pollution Control Agency | Solid Waste Permit |
| | Minnesota Department of Natural Resources | Section 401 Certification of C.O.E. Section 404 Permits |
| Metropolitan: | Metropolitan Council | Certificate of Need |
| Local: | Washington County | Sanitary Landfill License |
| | Valley Branch Water- shed District | Watershed District Permit |
| | City of Lake Elmo | Amendment to Comprehensive Plan Rezoning Wetland Permit Restrictive Soils Permit Fill Permit |

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-44-

1