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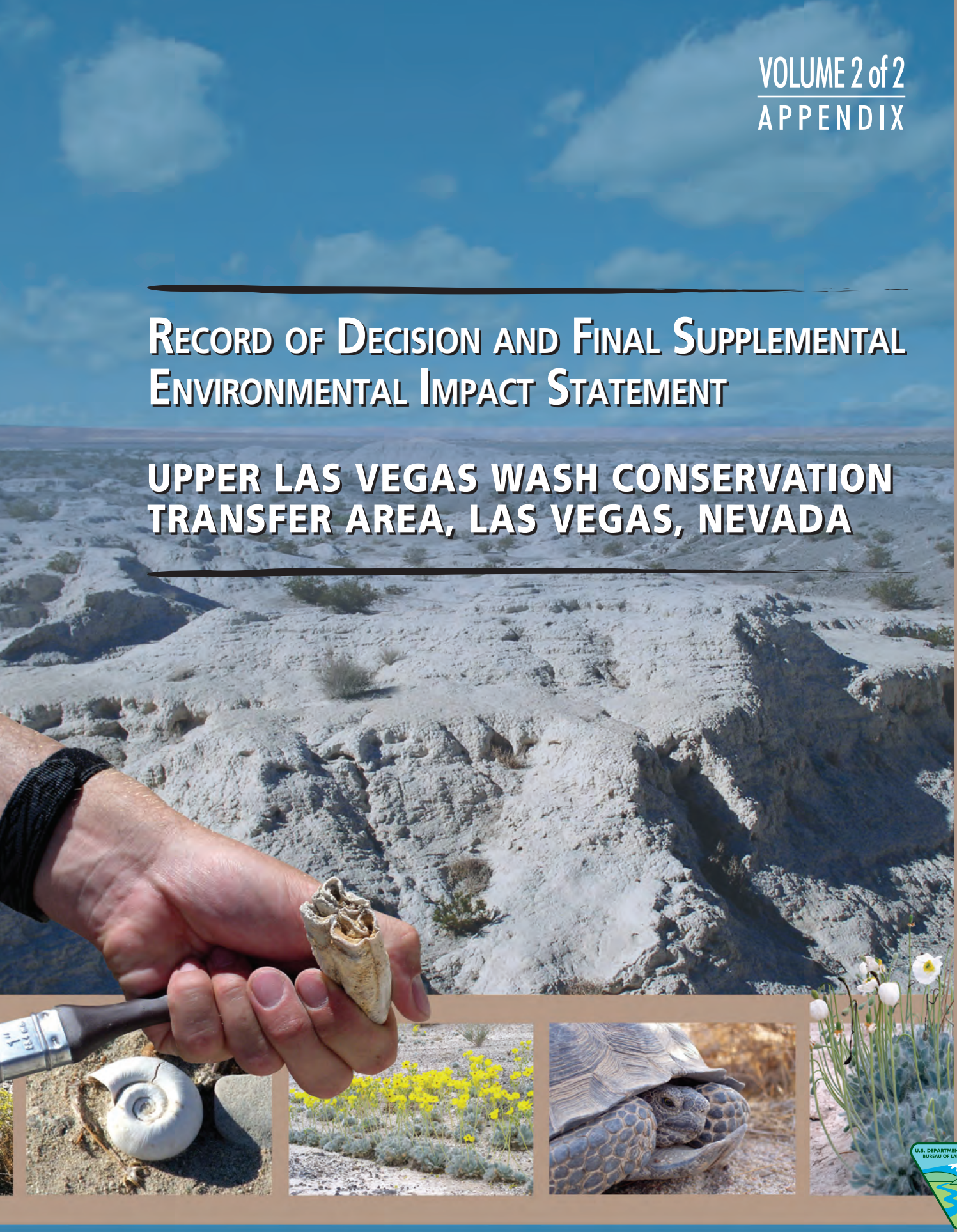
APPENDIX

BLM

Record of Decision and Final Supplemental Environmental Impact Statement

UPPER LAS VEGAS WASH CONSERVATION TRANSFER AREA, LAS VEGAS, NEVADA



U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

2011

MISSION STATEMENT

"The Bureau of Land Management is responsible for stewardship of our public lands. The BLM is committed to manage, protect, and improve these lands in a manner to serve the needs of the American people. Management is based upon the principles of multiple use and sustained yield of our Nation's resources within the framework of environmental responsibility and scientific technology. These resources include recreation, rangelands, timber, minerals, watershed, fish and wildlife habitat, wilderness, air, and scenic quality, as well as scientific and cultural values."

BLM/NV/LV/ES/11-23+1793

Appendix A

BEST MANAGEMENT PRACTICES

BEST MANAGEMENT PRACTICES

BMPs are management actions that have been developed by an agency, industry, and/or scientific community as methods for reducing environmental impacts to certain resources associated with certain kinds of activities. They have been developed by the Southern Nevada District Office specifically to guide future management of the CTA. Additionally, the revised 1994 edition of the *Handbook of Best Management Practices*, adopted by the Nevada State Environmental Commission, can be used as applicable.

BMPs typically are implemented at the discretion of the BLM Authorized Officer at the activity plan or project-specific level. Depending on the specific project and types of anticipated disturbances, BMPs may not be appropriate to apply in all cases. The BMPs identified here will be used to guide the development of the Conservation Strategy Agreement, revisions to the Las Vegas RMP, and individual land use authorizations to provide for long-term protection of sensitive resources within the CTA.

Soil Resources

- Use specialized low-surface impact equipment (e.g., vehicles with balloon tires) for off-road access, where travel on foot is not feasible, in order to protect fragile soils and other resource values.
- Salvage and reapply topsoil from construction activities as appropriate during reclamation.
- Comply with county, state, and federal standards for implementation of erosion controls. Apply appropriate erosion control practices, such as silt fences and check dams, near disturbed areas where appropriate.
- Identify areas that need to be avoided in the CTA to protect the LVF, sensitive plant habitat, and wash resources.
- Restore human-caused disturbances to soils in order to prevent habitat fragmentation, soil erosion, and loss of nutrients.
- Use native species in restoration to stabilize surfaces.
- Avoid soil disturbance in Las Vegas buckwheat, Las Vegas bearpoppy, and Merriam's bearpoppy habitat in order to manage for sustainable natural populations.

Water Resources

- Design land uses to minimize disturbance to the ULVW.
- Design approved roadways to allow natural floodwaters from the alluvial fan between the Sheep Mountain and Las Vegas ranges and the ULVW to flow in a natural fashion; this could include elevating roads, creating appropriate dissipation structures with outflow phalanges, and installing porous pavement.
- Avoid modifying the ULVW, such as armoring (e.g., riprap), channeling, diversion structures, detention basins, etc., in the design and construction of new projects and land uses.
- Maintain natural ecosystem processes, including surface flows, wind/water erosion and deposition, and nutrient cycling, when designing projects.
- Protect natural drainages when considering land use authorizations. Land use authorizations, including recreational permits, should be designed to minimize impacts to wash resources.

- Develop an In Lieu Fee Mitigation Program under the CWA that defines protection, enhancement, restoration, and monitoring actions for identified jurisdictional waters. Work with non-government groups and the USACE to establish the program.
- Engineer land use authorizations to protect the washes that provide for hydrologic and biological functioning of the system.
    - Design roads to span washes and/or leave wash bottoms undisturbed.
    - Construct gabions, water bars, and other low-impact flood control structures outside the ULVW, or in less sensitive areas within the CTA only if necessary, to reduce human-caused impacts to sensitive resources.
    - Coordinate with CCRFCD to establish an erosion monitoring program in key areas to track changes in erosion patterns that could negatively impact plant and paleontological resources as part of the Conservation Strategy Agreement.

Vegetation

- Develop procedures to reduce or eliminate impacts to special-status plant species. Measures could include relocating project facilities outside plant habitat, collecting seeds, salvaging topsoil, and propagating and planting native material.
- Identify areas that should be avoided for activities or land uses to protect sensitive plant resources.
- Land uses should be designed to the smallest footprint necessary.
- Restore disturbed habitat. Develop and implement habitat restoration protocols to restore and minimize negative impacts of authorized projects to sensitive plant species. Include actions that will identify revegetation, soil stabilization, and erosion reduction measures to ensure successful restoration of temporary construction areas. Require that restoration occur as soon as possible after completion of activities to speed up recovery of natural habitats.
- Control noxious weeds and invasive species. Develop actions that address weed inventory and monitoring, as well as education of personnel on weed identification, the manner in which weeds spread, and methods for treating infestations. Establish and implement weed protocols for reducing weed introductions from construction vehicles and equipment that are arriving from locations with known invasive vegetation problems. Protocols include establishing a controlled inspection and cleaning area, visually inspecting construction equipment arriving at the construction area, and ensuring that invasive propagules and seeds are removed from tires and other equipment surfaces.
- Protect natural ecological processes, such as pollinator movement, natural wind flow patterns, surface water flows, etc., that maintain sustainable populations by providing connectivity between populations in evaluating land uses.
- Maintain open spaces and corridors between populations when considering land uses.
- Establish long-term monitoring studies for the Las Vegas bearpoppy, Merriam’s bearpoppy, and Las Vegas buckwheat to track recruitment, population viability, and life history. Establish thresholds to detect declining populations and trigger additional conservation actions to be implemented when these ecological thresholds are hit as part of the Conservation Strategy Agreement.
- Ensure that developments and land uses are compatible with the long-term protection of the sensitive plant species, including avoidance of habitat or application of meaningful mitigation.

- Restore existing and new land disturbances in sensitive plant habitat.
  - Use stockpiled native soils and salvaged native plant material.
  - Use native species in approved developments within the CTA.
- Provide protection to sensitive plant habitat from activities such as illegal motorized use, dumping, trespassing, and other invasive uses through fencing, cleanups, or education.
- Provide ecological connectivity between Eglington Preserve and the CTA to the extent possible.

Educational and Recreational Opportunities

- Provide compatible educational, recreational, and interpretive opportunities in order for the public to enjoy and appreciate the unique resources of the CTA.
- Design uses, including recreational permits, to minimize impacts to sensitive resources.
- Appropriately interpret the Tule Springs site while protecting the historical and paleontological resources.
- Support studies and interpretation of the fossil resources in the CTA.
- Develop environmental education and interpretive programs for paleontological, cultural, and rare plant resources when such actions are consistent with the protection of the ULVW.
  - Locate uses in areas that reduce impacts to sensitive resources.
  - Develop ongoing public information and interpretation of the Las Vegas bearpoppy, Las Vegas buckwheat, cultural, and paleontological resources.
- Establish a non-motorized trail system, compatible with the protection of sensitive resources, for the enjoyment of the public. Provide interpretation to recreational users.
  - Locate trails and structures (kiosks, staging areas, restrooms, parking facilities, etc.) such that they do not conflict with the management of sensitive resources.
  - Uses, including recreational permits that are compatible with sensitive resource management goals, should be designed to minimize impacts.

Cultural Resources

- Consult with Indian Tribal Governments early in the process to identify issues regarding any proposed developments, including issues related to the presence of cultural properties, access rights, disruption to traditional cultural practices, and impacts to visual resources important to the tribe.
- Address the education of workers and the public to make them aware of the consequences of unauthorized collection of artifacts and destruction of property on public land.
- Protect the LVF, including the paleontological, geological, and cultural resources.
- Protect cultural resource sites and paleontological areas so that they are kept undisturbed and unfragmented.
- Provide mitigation and treatment for all paleontological and cultural resource sites that cannot be preserved in situ.

- Protect the 1,125-acre Tule Springs site as defined in the NRHP nomination form.[1] The Tule Springs site has national significance in our country's history and should be protected from destruction or impairment. Ensure that actions on BLM land do not conflict with the preservation of historic resources within Tule Springs.
- Cooperate with the Nevada Division of State Parks on the Tule Springs State lands, an inholding within the 1,125-acre Tule Springs site, to ensure consistency with management actions on BLM lands through a cooperative management agreement.
- Provide mitigation and treatment for all paleontological sites, cultural resource sites, and rare plants that cannot be preserved in situ.
- Protect Native American traditional use areas.
- Evaluate and, if significant, nominate a TCP for the ULVW, working closely with the tribes.
- Appropriately manage areas that have been identified as being sensitive to the Southern Paiute tribes, including the Las Vegas Paiute Tribe.
- If cultural resources are present at the site, or if areas with a high potential to contain cultural material have been identified, a cultural resources management plan shall be developed. The plan shall
    - Establish a cultural resources monitoring program; and
    - Identify measures to prevent potential looting/vandalism or erosion impacts.

Paleontological Resources

- Require a Discovery Plan for any authorized action that would cause disturbance in the LVF; a qualified paleontologist would be on-site during construction activities in case fossils are found.
- Protect the LVF, including the paleontological and geological resources.
- Manage the paleontological assemblages within the LVF.
    - Protect the CTA boundary and in situ fossil localities.
    - Work within BLM's statutes to protect the LVF within all approved R&PP Act leases.
- Establish appropriate in situ preservation areas for paleontological areas that are kept undisturbed and unfragmented for future research and interpretation.
- Maintain appropriate in situ key paleontological localities that are essential to understanding paleoecology within the LVF.
- Provide mitigation and treatment for all paleontological localities sites that cannot be preserved in situ.
- Conduct regular paleontological prospecting to ensure that new surface fossil sites eroding from the LVF are identified and protected.
- Establish a paleontological stewardship program to educate and train volunteers to monitor and assist in protecting the CTA.

[1] The NRHP lists the site as 980 acres. There has been no change to the boundary; rather, modern technology has allowed the acreage to be calculated with greater accuracy.

Appendix B

CONSERVATION GOALS AND OBJECTIVES—UPPER LAS VEGAS WASH CONSERVATION TRANSFER AREA

CONSERVATION GOALS AND OBJECTIVES—UPPER LAS VEGAS WASH CONSERVATION TRANSFER AREA

Many of the goals and objectives listed below were developed through numerous CTA public meetings between 2004 and 2006 that led up to the SEIS process. The public meetings helped BLM to achieve the following vision: *The CTA preserves the natural function of the Upper Las Vegas Wash, protects the sensitive resources within, and supports education, research, and low-impact recreational use. The CTA is ecologically functional to the maximum extent possible and managed to insure the long-term integrity of the Las Vegas Formation and associated fossil beds, the rare plant habitat for the Las Vegas bearpoppy, Merriam's bearpoppy, and Las Vegas buckwheat, as well as natural flood water capacity for present and future generations.*

In order to guide development of the conservation agreement and future management decisions within the final CTA boundary, the goals and objectives are listed below by the resource to which they apply. Goals and objectives may be listed under more than one resource.

Earth Resources

Ensure the long-term viability of Las Vegas buckwheat, Las Vegas bearpoppy, and Merriam's bearpoppy in sustainable natural populations within the boundaries of the ULVW CTA.

- Maintain rare plant habitat by preventing fragmentation of that habitat.
    - Protect the boundary of the CTA from the impacts of urbanization.
- Restore existing and new land disturbances in sensitive plant habitat.
    - Use stockpiled native soils and salvaged native plant materials.
    - Use native species in approved developments within the CTA.

Water Resources

Preserve the ecosystem of the ULVW in a natural state.

- Protect the CTA boundary from the impacts of urbanization.
- Maintain natural ecosystem processes, including surface flows, wind and water erosion and deposition, and nutrient cycling.
    - Protect natural drainages when considering land use authorizations.

Land use authorizations, including recreational permits that are compatible with sensitive resource management goals, should be designed to minimize impacts.

- Land use authorizations should be engineered to protect the washes that provide for the hydrologic and biological functioning of the system.
    - Engineering design may include spanning washes and/or leaving wash bottoms undisturbed.
    - Construct gabions, water bars, and other low-impact flood control structures outside the ULVW, or in less sensitive areas within the CTA only if necessary, to reduce human-caused impacts to sensitive resources.

  - Coordinate with the Regional Flood Control District to establish an erosion monitoring program in key areas to track changes in erosion patterns that could negatively impact plant and paleontological resources as part of the Conservation Agreement.
  - Develop an In Lieu Fee Mitigation Program that identifies protection, enhancement, restoration, and monitoring actions for jurisdictional WUS identified under the CWA. Work with non-governmental groups and the USACE to establish the program.

Vegetation

Ensure long-term viability of the Las Vegas buckwheat, Las Vegas bearpoppy, and Merriam's bearpoppy in sustainable natural populations within the boundaries of the ULVW CTA.

- Maintain rare plant habitat by preventing fragmentation of that habitat by development or use.
  - Protect the boundary of the CTA from the impacts of urbanization.
  - Land uses should avoid rare plant habitat.
- Protect natural ecological processes, such as pollinator movement, natural wind flow patterns, surface water flows, etc., that maintain sustainable populations by providing connectivity between populations.
  - Maintain open spaces and corridors between populations.
- Establish long-term monitoring studies for the Las Vegas bearpoppy and Las Vegas buckwheat to track recruitment, population viability, and life history. Establish thresholds to detect declining populations and trigger additional conservation actions to be implemented when these ecological thresholds are hit as part of the Conservation Agreement.
- Developments and land uses should be compatible with the long-term protection of the sensitive plant species, including avoidance of habitat or meaningful mitigation.
- Restore existing and new land disturbances in sensitive plant habitat.
  - Use stockpiled native soils and salvaged native plant material.
  - Use native species in approved developments within the CTA.
- Provide protection to sensitive plant habitat from activities such as illegal motorized use, dumping, trespass, and other invasive uses.

Preserve the ecosystem of the ULVW in a functional state.

- Protect the CTA boundary from the impacts of urbanization.
- Maintain natural ecosystem processes, including surface flows, wind and water erosion and deposition, and nutrient cycling.
- Provide ecological connectivity between Eglington Preserve and the CTA to the extent possible.

Provide compatible educational, recreational, and interpretive opportunities in order for the public to enjoy and appreciate the unique resources of the CTA.

- Develop environmental education and interpretive programs for key paleontological and cultural sites when such actions are consistent with the protection of the ULVW.
  - Locate uses in areas that reduce impacts to sensitive resources.
  - Develop ongoing public information and interpretation of the Las Vegas bearpoppy, Las Vegas buckwheat, cultural, and paleontological resources.

- Establish a non-motorized trail system, compatible with the protection of sensitive resources, for the enjoyment of the public.
    - Locate trails and structures (staging areas, restrooms, parking facilities, etc.) such that they do not conflict with the management of sensitive resources.

Uses, including recreational permits that are compatible with sensitive resource management goals, should be designed to minimize impacts.

- Land uses should avoid plant habitat that has been identified to be preserved intact.
- Land uses should be designed to the smallest area necessary.
- Land uses should be engineered to protect the washes that provide for the hydrologic and biological functioning of the system.

Cultural Resources

Protect the LVF, including the paleontological, geological, and cultural resources.

- Establish in situ preservation areas for cultural resource sites and paleontological areas that are kept undisturbed and unfragmented.
- Provide mitigation and treatment for all paleontological sites, cultural resource sites, and rare plants that cannot be preserved in situ.
- Preserve the 1,125-acre Tule Springs site as defined in the NRHP nomination form.[1] The Tule Springs site is nationally significant in our nation's history and should be protected from destruction or impairment.
    - Cooperate with the Nevada Division of State Parks on the Tule Springs state lands, an inholding within the 1,125-acre Tule Springs site, to ensure consistency with management actions on BLM land through cooperative management agreements.
    - Ensure that actions on BLM land do not conflict with the preservation of the cultural resources and lands within the defined boundary.
- Provide mitigation and treatment for all paleontological sites, cultural resource sites, and rare plants that cannot be preserved in situ.

Protect Native American traditional use areas.

- Evaluate and, if significant, nominate a TCP for the ULVW, working closely with the tribes.
- Protect areas that have been identified as being sensitive to the Southern Paiute tribes, including the Las Vegas Paiutes.

Paleontological Resources

Protect the LVF, including the paleontological, geological, and cultural resources.

- Manage the paleontological assemblages within the LVF.
    - Protect the boundary and all major fossil surface localities.
    - Work within BLM's statutes to protect the LVF within all approved R&PP Act leases.

[1] The NRHP lists the site as 980 acres. There has been no change to the boundary; rather, modern technology has allowed the acreage to be calculated with greater accuracy.

- Establish in situ preservation areas for cultural resource sites and paleontological areas that are kept undisturbed and unfragmented.
- Maintain in situ key paleontological localities that are essential to understand paleoecology within the LVF.
- Provide mitigation and treatment for all paleontological localities, cultural resource sites, and rare plants that cannot be preserved in situ.
- Conduct regular paleontological inventories to ensure that new surface fossil sites eroding from the LVF are identified and protected.
- Support studies and interpretation of the fossil resources in the CTA.
- Establish a paleontological stewardship program to educate and train volunteers to monitor and assist in protecting the CTA.

Visual Resources

Preserve the ecosystem of the ULVW in a functional state.

- Protect the CTA boundary from the impacts of urbanization.
- Maintain natural ecosystem processes, including surface flows, wind and water erosion and deposition, and nutrient cycling.

Land Use

Preserve the ecosystem of the ULVW in a functional state.

- Protect the CTA boundary from the impacts of urbanization.
- Maintain natural ecosystem processes, including surface flows, wind and water erosion and deposition, and nutrient cycling.

Uses, including recreational permits that are compatible with sensitive resource management goals, should be designed to minimize impacts.

- Land uses should avoid plant habitat that has been identified to be preserved intact.
- Land uses should avoid fragmentation of the LVF to the extent possible.
- Land uses should be designed to the smallest area necessary.
- Land uses should be engineered to protect the washes that provide for the hydrologic and biological functioning of the system.

Recreation

Uses, including recreational permits that are compatible with sensitive resource management goals, should be designed to minimize impacts. Provide compatible educational, recreational, and interpretive opportunities in order for the public to enjoy and appreciate the unique resources of the CTA.

- Develop environmental education and interpretive programs for key paleontological and cultural sites when such actions are consistent with the protection of the ULVW.
    - Locate uses in areas that reduce impacts to sensitive resources.

  - Develop ongoing public information and interpretation of the Las Vegas bearpoppy, Las Vegas buckwheat, cultural, and paleontological resources.

- Establish a non-motorized trail system, compatible with the protection of sensitive resources, for the enjoyment of the public.
  - Locate trails and structures (staging areas, restrooms, parking facilities, etc.) such that they do not conflict with the management of sensitive resources.

Hazardous Materials

Ensure long-term viability of the Las Vegas buckwheat, Las Vegas bearpoppy, and Merriam's bearpoppy in sustainable natural populations within the boundaries of the CTA.

- Restore existing and new land disturbances that result in soil contamination in sensitive plant habitat.
- Provide protection to sensitive plant habitat from activities such as illegal motorized use, dumping, trespass, and other invasive use.
- Protect the CTA boundary from the impacts of urbanization.

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Appendix C

NATIVE PLANT PROTECTIONS UNDER NEVADA STATE LAW

BLM MANUAL 6840.06

Sensitive species are taxa that are not already included as BLM special-status species under 1) federally listed, proposed, or candidate species; or 2) State of Nevada listed species. BLM policy is to provide these species with same level of protection as is provided for candidate species in BLM Manual 6840.06, that is, to "ensure that actions authorized, funded, or carried out do not contribute to the need for the species to become listed." The Sensitive Species designation is normally used for species that occur on BLM-administered lands for which BLM has the capability to significantly affect the conservation status of the species through management. BLM Manual 6840.06 provides factors by which a native species may be listed as "sensitive" if it:

1. Could become endangered or extirpated from a state, or within a significant portion of its range in the foreseeable future;
2. Is under status review by the USFWS and/or National Marine Fisheries Service;
3. Is undergoing significant current or predicted downward trends in a) habitat capability that would reduce a species' existing distribution; and/or b) population or density such that federally listed, proposed, candidate, or state-listed status may become necessary;
4. Typically consists of a small, widely dispersed population;
5. Inhabits ecological refugia or specialized or unique habitats;
6. Is state listed but may be better conserved through application of BLM sensitive species status.

Many of the plant species on Nevada's critically endangered species list are not federally listed by the USFWS because of the protection afforded them under Nevada State law (BLM 2004a; NRS 527.260–527.300).

PROTECTION AND PROPAGATION OF SELECTED SPECIES OF NATIVE FLORA

Under the NRS 527.260 legislative finding:

1. The Legislature finds that:
    a) The economic growth of the State of Nevada has been attended with some serious and unfortunate consequences. Nevada has experienced the extermination or extirpation of some of its native species of flora. Serious losses have occurred and are occurring in other species of flora with important economic, educational, historical, political, recreational, scientific, and aesthetic values.
    b) The people of the State of Nevada have an obligation to conserve and protect the various species of flora that are threatened with extinction.
2. The purpose of NRS 527.260–527.300, inclusive, is to provide a program for the conservation, protection, restoration, and propagation of selected species of flora and for the perpetuation of the habitats of such species.

(Added to NRS by 1969, 775.)

NRS 527.270

List of species declared to be threatened with extinction; special permit required for removal or destruction. A species or subspecies of native flora shall be regarded as threatened with extinction when the State Forester Firewarden, after consultation with competent authorities, determines that its existence is endangered and its survival requires assistance because of overexploitation, disease, or other factors or because its habitat is threatened with destruction, drastic modification or severe curtailment. Any species declared to be threatened with extinction shall be placed on the list of fully protected species, and no member of its kind may be removed or destroyed at any time by any means except under special permit issued by the State Forester Firewarden.

(Added to NRS by 1969, 775.)

NRS 527.280

Destruction or removal of dangerous species by State Forester Firewarden. Where any species of flora which is declared to be in danger of extinction pursuant to NRS 527.270 is found to be dangerous to domestic animals or fowl or a menace to health, the State Forester Firewarden may provide for its destruction or its removal, alive, for translocating.

(Added to NRS by 1969, 775.)

NRS 527.290

Duties of Governor. The Governor shall review the programs which he administers and, to the extent practicable, use such programs in furtherance of the purpose of NRS 527.260–527.300, inclusive, and shall encourage other state and federal agencies to use their authorities in such a manner.

(Added to NRS by 1969, 775.)

NRS 527.300

Powers and duties of State Forester Firewarden. In carrying out the program authorized by NRS 527.260–527.300, inclusive, the State Forester Firewarden, subject to the approval of the Director of the State Department of Conservation and Natural Resources, shall cooperate, to the maximum extent practicable, with other states and with the counties in the State of Nevada, and may enter into agreements with such other states and counties and with other legal entities for the administration and management of any area established pursuant to NRS 527.260–527.300, inclusive, for the conservation, protection, restoration, and propagation of species of native flora which are threatened with extinction.

(Added to NRS by 1969, 775; A 1977, 1168.)

Appendix D

BLM PALEONTOLOGICAL CLASSIFICATION

BLM: CONDITIONS 1–3

Paleontological resource classification is a ranking of areas according to their potential to contain vertebrate fossils or noteworthy occurrences of invertebrate or plant fossils. These rankings are used in land use planning, as well as to identify areas that may warrant special management or special designation, such as ACECs. BLM (1998b) classifies public lands on the basis of the potential for paleontological "areas" to contain noteworthy occurrences of fossils by using the following criteria:

- **Condition 1.** Areas that are known to contain vertebrate fossils or noteworthy occurrences of invertebrate or plant fossils. Consideration of paleontological resources will be necessary if the field office review of available information indicates that such fossils are present in the area.
- **Condition 2.** Areas with exposures of geological units or settings that have high potential to contain vertebrate fossils or noteworthy occurrences of invertebrate or plant fossils. The presence of geologic units from which such fossils have been recovered elsewhere may require further assessment of these same units where they are exposed in the area of consideration.
- **Condition 3.** Areas that are very unlikely to produce vertebrate fossils or noteworthy occurrences of invertebrate or plant fossils on the basis of their surficial geology, igneous or metamorphic rocks, extremely young alluvium, colluvium, or eolian deposits or the presence of deep soils. However, if possible, it should be noted at what depth bedrock may be expected in order to determine whether fossiliferous deposits may be uncovered during surface-disturbing activities.

Either Condition 1 or 2 may trigger the initiation of a formal analysis of existing data prior to the authorization of land use actions involving surface disturbance or transfer of title. Condition 3 suggests that further paleontological consideration is generally unnecessary.

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Appendix E

USFS PALEONTOLOGICAL CLASSIFICATION

USFS: POTENTIAL FOSSIL YIELD CLASSIFICATION

Occurrences of paleontological resources are closely related to the geological units that contain them. The potential for finding important paleontological resources can, therefore, be broadly predicted by the presence of the pertinent geological units at or near the surface. Therefore, geological mapping can be used as a proxy for assessing the potential for the occurrence of important paleontological resources. The PFYC system was originally developed by the USFS Paleontology Center of Excellence and the Region 2 Paleo Initiative (USFS 1996). It is in the process of being formally adopted by the BLM to promote consistency between agencies and throughout the BLM. The PFYC should be used for land use planning efforts and for the preliminary assessment of potential impacts and mitigation needs for specific projects.

Under the PFYC system, geological units are classified on the basis of the relative abundance of vertebrate fossils or uncommon invertebrate or plant fossils and their sensitivity to adverse impacts; a higher class number indicates a higher potential. This classification should be applied at the geological formation or member level. It is not intended to be an assessment of whether important fossils are known to occur occasionally in these units (i.e., a few important fossils or localities widely scattered throughout a formation do not necessarily indicate a higher class), nor is it intended to be applied to specific sites or areas. The classification system is intended to provide baseline guidance for assessing and mitigating impacts to paleontological resources. In many situations, the classification should be an intermediate step in the analysis and should be used to assess additional mitigation needs. For the purposes of this overview study, Class 4/5 was added to the PFYC to replace Classes 4 and 5, which are described below (see Chapter 3, Section 3.6, “Paleontological Resources,” for an explanation).

- **Class 1.** Class 1 units are geological units that are not likely to contain recognizable fossil remains. This includes units that are igneous or metamorphic in origin (but excludes tuffs), as well as units that are Precambrian in age or older. Management concern for paleontological resources in Class 1 units is negligible or not applicable. No assessment or mitigation is needed, except in very rare circumstances. The occurrence of significant fossils in Class 1 units is nonexistent or extremely rare.
- **Class 2.** Class 2 units are sedimentary geological units that are not likely to contain vertebrate fossils or scientifically significant nonvertebrate fossils.[1] This includes units in which vertebrate or significant nonvertebrate fossils are unknown or very rare, units that are younger than 10,000 years B.P., units that are eolian in origin, and units that exhibit significant diagenetic alteration. The potential for impacting vertebrate fossils or uncommon invertebrate or plant fossils is low. Management concern for paleontological resources is low, and management actions are not likely to be needed. Localities containing important resources may exist but would be rare and would not influence the classification.
- **Class 3.** Class 3 units are fossiliferous sedimentary geological units where fossil content varies in significance, abundance, and predictable occurrence, or sedimentary units of unknown fossil potential. These units are often marine in origin, with sporadic known occurrences of vertebrate fossils. Vertebrate fossils and uncommon nonvertebrate fossils are known to occur inconsistently, and predictability is known to be low. Class 3 includes units that are poorly studied or poorly documented, so that the potential yield cannot be assigned without ground reconnaissance. Management concern for paleontological resources in these units is moderate or cannot be determined from existing data. Surface-disturbing activities may require field assessment to determine a further course of action. The Class 3 category includes a broad range of potential impacts. Geological units of unknown potential, as well as units of moderate or infrequent fossil occurrence are included. Assessment and mitigation efforts also include a broad range of options. Surface-disturbing activities will require sufficient assessment to determine whether significant

[1] In the USFS PFYC system, nonvertebrates refers to fossil invertebrates and plants.

fossil resources occur in the area of a proposed action and whether the action could affect the paleontological resources. Authorizations for any surface-disturbing activities should include the following statement, or one similar in nature:

> The operator shall immediately bring any paleontological resources discovered as a result of operations under this authorization to the attention of the BLM-authorized officer. The operator shall suspend all activities in the vicinity of such discovery until notified to proceed by the authorized officer and shall protect the site from damage or looting. The authorized officer will evaluate, or will have evaluated, such discoveries as soon as possible, but not later than five working days after being notified. Appropriate measures to mitigate adverse effects to significant paleontological resources will be determined by the authorized officer after consulting with the operator. The operator is responsible for the cost of any investigation necessary for the evaluation and for any mitigation measures. There is no need to suspend operations if the operator can avoid further impacts to a discovered site; however, the discovery shall be brought to the attention of the authorized officer as soon as possible and protected from damage or looting.

- **Class 4.** Class 4 units are Class 5 geological units (see below) that have lowered risks of human-caused adverse impacts or lowered risk of natural degradation. They include bedrock units with extensive soil or vegetative cover, bedrock exposures that are limited or not expected to be impacted, units with areas of exposed outcrop smaller than 2 contiguous acres, units in which outcrops form cliffs of sufficient height and slope that impacts are minimized by topographic effects, and units where other characteristics are present that lower the vulnerability of both known and unidentified fossil localities. The potential for impacting significant fossils is moderate to high and is dependent on the proposed action. The bedrock unit is Class 5, but a protective layer of soil, thin, alluvial material, or other mitigating circumstances may lessen or prevent potential impacts to the bedrock that could result from the activity. Mitigation efforts must include assessment of the disturbance, such as removal or penetration of protective surface alluvium or soils, potential for future accelerated erosion, or increased ease of access that could result in greater looting potential. If impacts to significant fossils are anticipated, on-the-ground surveys before authorization of the surface-disturbing action will usually be necessary. On-site monitoring may also be necessary during construction activities. Management prescriptions for resource preservation and conservation through controlled access or special management designation should be considered. Class 4 and 5 units are often combined as Class 5 for general application, such as planning efforts or preliminary assessments, because Class 4 is determined from local mitigating conditions and the impacts of the planned action.

- **Class 5.** Class 5 units are highly fossiliferous geological units that regularly and predictably produce vertebrate fossils or uncommon invertebrate or plant fossils and that are at risk of human-caused adverse impacts or natural degradation. These include units in which vertebrate fossils or uncommon invertebrate or plant fossils are known and documented to occur consistently, predictably, or abundantly. Class 5 pertains to highly sensitive units that are well exposed, with little or no soil or vegetative cover, units in which outcrop areas are extensive, and exposed bedrock areas larger than 2 contiguous acres. Management concern for paleontological resources in Class 5 units or areas is high because the potential for impacting significant fossils is high. Vertebrate fossils or uncommon nonvertebrate fossils are known from the impacted area or can reasonably be expected to occur in the impacted area. Assessment by a qualified paleontologist is required in advance of surface-disturbing activities or land-tenure adjustments, and mitigation will often be necessary before or during surface-disturbing actions, or both. Field surveys before authorization of any surface-disturbing activities will usually be necessary. On-site monitoring may also be necessary during construction activities. Designation of areas of special interest and concern may be appropriate.

Appendix F

ENVIRONMENTAL DATABASES

Table F-1. Environmental Database Descriptions*

Federal Database	Database Description
National Priority List (NPL)	NPL is a list of Superfund sites maintained by the U.S. Environmental Protection Agency (EPA). Sites listed on the NPL reflect significant risk to public health and the environment and indicate a federal priority to remediate the site.
NPL (Delisted)	Achievement of NPL-delisted status indicates that an uncontrolled hazardous waste site (Superfund site) has been remediated or that it has been determined that no further response is appropriate and that the site therefore is no longer considered a federal priority.
Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS)	CERCLIS is the EPA's list of potential Superfund sites currently or previously under investigation.
CERCLIS No Further Remedial Action Planned (NFRAP)	CERCLIS NFRAP status indicates that a site has been evaluated and that EPA has determined that it not be included on the NPL.
Resource Conservation and Recovery Act (RCRA) Corrective Actions	This is EPA's list of RCRA facilities that have reported violations and that are subject to corrective actions.
RCRA Treatment, Storage, and Disposal	This is EPA's list of RCRA facilities licensed to store, treat, and dispose of hazardous waste materials.
RCRA Generators	This is EPA's list of facilities that generate or transport hazardous waste. EPA categorizes the facilities as large-quantity generators (LGNs), small-quantity generators (SGNs), or conditionally exempt generators (VGNs).
RCRA No Longer Regulated	This is a list of facilities that are not currently classified by EPA because 1) failure to report in a timely manner; 2) no longer in business; 3) no longer in business at the listed address; or 4) no longer generating hazardous waste materials in quantities that require reporting.
Federal Institutional and Engineering Controls (IC/EC)	IC/EC is a list of Superfund sites that have either engineering or institutional controls. Engineering controls include caps, building foundations, liners, and treatment methods to eliminate the means by which regulated substances can enter into the environment or affect human health. Institutional controls seek to prevent exposure to contaminants remaining on-site. Common institutional controls include groundwater-use restrictions, construction restrictions, property-use restrictions, deed restrictions, and post-remediation care requirements.
Emergency Response Notification System (ERNS)	ERNS database maintains information about emergency response actions to reported releases of hazardous materials or unidentified substances.
Federal Wells	U.S. Geological Survey maintains a list of wells, springs, test holes, tunnels, drains, and excavations throughout the U.S.
Tribal Lands	These are areas with boundaries established by treaty, statute, and/or executive or court order that are recognized by the federal government as territory in which American Indian tribes have primary governmental authority.
State/Tribal Sites Corrective Action Cases	Bureau of Corrective Actions maintains a list of clean-up evaluations and actions regarding sites with actual or potential contamination that could affect groundwater.
State/Tribal Solid Waste Landfills (SWL)	SWL maintains an inventory of various solid waste facilities, including open, closed, and permitted landfills, dumps, pesticide sites, and transfer stations. The inventory specifies the landfill class type and whether the site is a private or governmental facility.
State/Tribal Leaking Underground Storage Tanks (LUSTs)	This division maintains an inventory of sites with LUSTs, and includes sites with tanks under investigation for potential leaks or confirmed leaks, and those to be closed.
State/Tribal Underground Storage Tanks (USTs)/ Aboveground Storage Tanks (ASTs)	This division maintains an inventory of USTs, a list of sites with ASTs, and a list of USTs currently on tribal lands under federal jurisdiction. Nevada tribal land USTs are administered by EPA Region 9.
State/Tribal Engineering Controls/Institutional Controls	A Nevada state list of Superfund sites that have engineering or institutional controls (as noted under Federal IC/EC).

Table F-1. Environmental Database Descriptions* (Continued)

Federal Database	Database Description
State/Tribal Brownfields	NDEP defines a Brownfield as an abandoned, idled, or underused industrial or commercial property that has been taken out of productive use because of real or perceived risks from environmental contamination. The Bureau of Corrective Actions maintains a list of Brownfield sites as part of its listing of clean-up evaluations and actions regarding sites with actual or potential contamination that could affect groundwater.
State/Tribal Voluntary Remediation or Clean-Up Programs (VCPs)	VCPs are the state-level authority for addressing the clean-up of Brownfields.
Receptors	This is the 2002 Census Bureau's database of schools and hospitals that may house individuals deemed sensitive to environmental discharges as a result of their fragile immune systems.
Facility Index System (FINDS)	FINDS is an index of identification numbers associated with a property or facility that EPA has investigated or has been made aware of in conjunction with various regulatory programs.
Toxic Release Inventory System (TRIS)	TRIS is a database of all facilities that have had or may be prone to toxic material releases.
Hazardous Materials Incident Response System (HMIRS)	HMIRS is a database of information on materials and packaging, and a description of events for tracked incidents.
National Compliance Database System (NCDB)	NCDB is EPA's tracking system for regional compliance and enforcement and a national repository for the Pesticides and Toxic Substances Compliance and Enforcement program.
PolyChlorinated BiPhenol (PCB) Administrative Database System	This is EPA's register of facilities that generate, transport, store, or dispose of PCB.
Docket Integrated Compliance Information System	This is a federal database of administrative and judicial cases under the following environmental statutes: Clean Air Act; Clean Water Act; RCRA; the Emergency Planning and Community Right-to-Know Act Section 313; the Toxic Substances Control Act; the Federal Insecticide, Fungicide, and Rodenticide Act; the Comprehensive Environmental Response, Compensation, and Liability Act; the Safe Drinking Water Act; and the Marine Protection, Research, and Sanctuaries Act.
Nuclear Permits	This is a database of facilities that are permitted and regulated for their use and handling of radioactive materials.
Releases	This is a list of hazardous materials releases.
Federal—Other	This is EPA's database of registration and production data for facilities that manufacture pesticides.
Site Enforcement Tracking System Potentially Responsible Parties	This is EPA's database of parties identified by EPA as being potentially responsible for contamination at a CERCLIS or NPL site.
Coal Gasification	This is a database of sites that have been involved in coal gasification.
Oil and Gas Wells	This is a list of completions, pluggings, and permits obtained from digital data provided by the regulatory agency.
Fire Insurance Map Coverage	This is a database of historical fire insurance maps.

* In most cases, the database descriptions closely follow those provided by Environmental FirstSearch.

Appendix G

BLM LAND AND MINERAL RESOURCES LR2000 PUBLIC RECORDS DATABASE SEARCH RESULTS:

MATERIAL SITE RIGHTS-OF-WAY AND GRAVEL PIT SEARCHES

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Admin State: NV
Geo State: NV

Mer/Twp/Rng: 21 0180S 0590E

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark		
NVCC 0018191	282105	AUTHORIZED	304	AUTH AMENDED/MODIFIED	08/21/1970	/B/		Total Acres = 629.16
NV DEPT OF TRANS		1263 S STEWART ST		CARSON CITY	NV	89712	100.00000	HOLDER

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
022	ALIQ		01	W2NW,SENW,E2SW,NWSW,NWSE;
022	ALIQ		02	S2SE;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark		
NVCC 0021488	286203	CLOSED	970	CASE CLOSED	10/30/2007			Total Acres = 1654.855
NEVADA BELL		PO BOX 11010 RM C259		RENO	NV	89502	100.00000	HOLDER/BILLEE

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
022	ALIQ			W2NW,N2SW,SESW,SWSE;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark		
NVN 020856	311111	CLOSED	970	CASE CLOSED	07/14/1988			Total Acres = 1920
MORMAC OIL & GAS CO		321 TEXAN TRAIL #100		CORPUS CHRISTI	TX	78411	50.00000	LESSEE
TIPPERARY OG CORP		BOX 3179		MIDLAND	TX	79702	50.00000	LESSEE

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
022	ALIQ			ALL;
023	ALIQ			ALL;
024	ALIQ			ALL;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark		
NVN 041567	240006	CLOSED	967	CLOSED WITHOUT ACTION	05/20/1991			Total Acres = 255
CLARK CNTY SCHOOL DIST		2832 E FLAMINGO RD		LAS VEGAS	NV	89121	100.00000	APPLICANT

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
023	ALIQ			SENWNW;

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Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 04156712	240006	CLOSED	970	CASE CLOSED	05/18/2004		Total Acres = 10
CLARK CNTY SCHOOL DIST		2832 E FLAMINGO RD		LAS VEGAS	NV	89121	100.00000 APPLICANT

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
023	RSDL			SENWNW;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 04156732	291200	CLOSED	970	CASE CLOSED	05/18/2004		Total Acres = 10
CLARK CNTY SCHOOL DIST		2832 E FLAMINGO RD		LAS VEGAS	NV	89121	100.00000 APPLICANT

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
023	RSDL			SENWNW;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 048989	361113	CLOSED	970	CASE CLOSED	04/13/1995		Total Acres = 640
MEURER JOHN W		3713 SAN ANGELO AVE		LAS VEGAS	NV	89102	100.00000 PERMITTEE

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
023	ALL			ENTIRE SECTION

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 052308	287001	CLOSED	970	CASE CLOSED	11/24/2003		Total Acres = 4960
N LAS VEGAS CITY		2200 CIVIC CTR DR		N LAS VEGAS	NV	89030	100.00000 APPLICANT

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
024	ALL			ENTIRE SECTION

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 054017	286203	CLOSED	970	CASE CLOSED	06/21/2002		Total Acres = 1
CENTRAL TELEPHONE CO		330 S VALLEY VIEW BLVD		LAS VEGAS	NV	89152	100.00000 APPLICANT

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
022	ALIQ			SWSWNWNW,SWNW,NESW,SWSE;

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Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 054351	286207	AUTHORIZED	304	AUTH AMENDED/MODIFIED	05/08/2006	503-2.980;	Total Acres = 72.734
AF		5870 DEVLIN DR BLDG 595		NELLIS AFB	NV	89191	100.00000 HOLDER

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
022	ALIQ			NWSW,S2SW;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 058546	289001	PENDING	124	APLN RECD	03/02/1994		Total Acres = 3.636
LAS VEGAS PAIUTE TRIBE		#1 PAIUTE DR		LAS VEGAS	NV	89106	100.00000 APPLICANT

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
022	RSDL			S2SESE;
023	RSDL			S2S2S2;
024	RSDL			S2S2S2;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 073706	286203	AUTHORIZED	307	ROW GRANTED-ISSUED	11/20/2006		Total Acres = 797.74
NEVADA BELL		PO BOX 11010 RM C259		RENO	NV	89502	100.00000 HOLDER/BILLEE

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
022	ALIQ			SWNW,N2SW,SESW,SWSE;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 076432	286203	PENDING	153	POST AUTH APLN RECD	05/01/2007	/C/	Total Acres = 39.704
NV POWER CO		PO BOX 98910		LAS VEGAS	NV	89151	100.00000 HOLDER/BILLEE

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
022	ALIQ			NWSW,S2SW;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 076653	231145	AUTHORIZED	868	EFFECTIVE DATE	11/06/2002		Total Acres = 23334.16
BLM		4701 N TORREY PINES DR		LAS VEGAS	NV	891302301	100.00000 ADMIN MGT ENTITY

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Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
022	ALL			ENTIRE SECTION
023	ALL			ENTIRE SECTION
024	ALL			ENTIRE SECTION

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark
NVN 077149	280004	CLOSED	970	CASE CLOSED	03/31/2005	Total Acres = 0.83
UNIVERSITY OF NV RENO		4505 MARYLAND PKY		LAS VEGAS	NV 891544004	100.00000 HOLDER

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
022	RSDL			NESWSE;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark
NVN 07839501	280004	PENDING	124	APLN RECD	04/08/2004	Total Acres = 3.5
SOUTHERN NV WATER AUTHORITY		1900 E FLAMINGO #170		LAS VEGAS	NV 89119	100.00000 APPLICANT

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
022	ALIQ			W2SW;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark
NVN 083498	285003	PENDING	124	APLN RECD	05/03/2007	Total Acres = 12.4
NV POWER CO		PO BOX 98910		LAS VEGAS	NV 89151	100.00000 APPLICANT

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
022	ALIQ			W2W2;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark
NVN 083499	285003	PENDING	124	APLN RECD	05/03/2007	Total Acres = 12.4
NV POWER CO		PO BOX 98910		LAS VEGAS	NV 89151	100.00000 APPLICANT

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
022	ALIQ			W2W2;

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Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 08349901	285003	PENDING	124	APLN RECD	05/03/2007		Total Acres = 12.4
NV POWER CO		PO BOX 98910		LAS VEGAS	NV	89151	100.00000 APPLICANT

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
022	ALIQ			SWSW;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 0043546	285003	AUTHORIZED	304	AUTH AMENDED/MODIFIED	04/04/2007	/H1/	Total Acres = 546.77
NV POWER CO		PO BOX 98910		LAS VEGAS	NV	89151	100.00000 HOLDER/BILLEE

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
022	ALIQ			W2SW,SESW;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 0055903	285002	AUTHORIZED	307	ROW GRANTED-ISSUED	10/14/1960		Total Acres = 68.56
NV POWER CO		PO BOX 98910		LAS VEGAS	NV	89151	100.00000 HOLDER/BILLEE

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
023	ALIQ			N2NE,SENE,NENW;
024	ALIQ			SWNW,SW;

Mer/Twp/Rng: 21 0180S 0600E

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 020286	311111	CLOSED	970	CASE CLOSED	09/01/1993		Total Acres = 1600
NUGGET OIL CORP		BOX 27156		SALT LAKE CITY	UT	84127	50.00000 LESSEE
STANDARD ENERGY CORP		BOX 27156		SALT LAKE CITY	UT	84127	50.00000 LESSEE

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
028	ALIQ			ALL;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 020287	311111	CLOSED	970	CASE CLOSED	09/01/1993		Total Acres = 2543.88
NUGGET OIL CORP		BOX 27156		SALT LAKE CITY	UT	84127	50.00000 LESSEE
STANDARD ENERGY CORP		BOX 27156		SALT LAKE CITY	UT	84127	50.00000 LESSEE

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Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
029	ALIQ			ALL;
030	ALIQ			E2W2,E2;
030	LOTS			1-4;
031	ALIQ			E2W2,E2;
031	LOTS			1-4;
032	ALIQ			ALL;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark			
NVN 020288	311111	CLOSED	970	CASE CLOSED	09/01/1993				Total Acres = 2560
NUGGET OIL CORP		BOX 27156		SALT LAKE CITY	UT	84127	50.00000	LESSEE	
STANDARD ENERGY CORP		BOX 27156		SALT LAKE CITY	UT	84127	50.00000	LESSEE	

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
033	ALIQ			ALL;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark			
NVN 020858	311111	CLOSED	970	CASE CLOSED	09/01/1991				Total Acres = 1280
MORMAC OIL & GAS CO		321 TEXAN TRAIL #100		CORPUS CHRISTI	TX	78411	100.00000	LESSEE	

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
020	ALIQ			ALL;
021	ALIQ			ALL;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark			
NVN 021996	311111	CLOSED	970	CASE CLOSED	09/01/1991				Total Acres = 160
SOCO 1978 AC PROG		1800 GLENARM PL #700		DENVER	CO	80202	100.00000	LESSEE	

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
019	ALIQ			NE;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark			
NVN 021996A	311111	CLOSED	970	CASE CLOSED	09/01/1991				Total Acres = 470.32
BLM		PO BOX 12000		RENO	NV	89520	100.00000	HOLDING AGENCY	

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Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
019	ALIQ			E2W2,SE;
019	LOTS			1-4;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark		
NVN 037233	287001	PENDING	124	APLN RECD	10/07/1982			Total Acres = 1280
LAS VEGAS CITY OF		400 STEWART AVE		LAS VEGAS	NV	89101	100.00000	APPLICANT

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
033	ALL			ENTIRE SECTION

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark		
NVN 039819	291100	CLOSED	970	CASE CLOSED	11/05/1987			Total Acres = 1912.67
GUSAKOV M A		6147 O'BANNON DR		LAS VEGAS	NV	89102	100.00000	APPLICANT

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
031	ALIQ			E2,E2W2;
031	LOTS			1-4;
032	ALIQ			ALL;
033	ALIQ			ALL;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark		
NVN 042793	181050	CLOSED	967	CLOSED WITHOUT ACTION	10/07/1991			Total Acres = 235
HOPKINS AMOS ABE		RT 1 BOX 128 A		ELGIN	OK	73538	100.00000	PLAINTIFF

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
032	ALIQ			SE;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark		
NVN 045207	286001	CLOSED	970	CASE CLOSED	04/30/1988			Total Acres = 40
WAYNE NEWTON COMM		1120 CONNECTICUT		WASHINGTON	DC	20036	100.00000	APPLICANT

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
030	ALIQ			SENE;

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NVN 052308	287001	CLOSED	970	CASE CLOSED	11/24/2003		Total Acres = 4960
N LAS VEGAS CITY		2200 CIVIC CTR DR		N LAS VEGAS	NV	89030	100.00000 APPLICANT

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
019	ALIQ			E2W2,SE;
019	LOTS			1-4;
028	ALIQ			S2;
029	ALL			ENTIRE SECTION
030	ALIQ			E2,E2W2;
030	LOTS			1-4;
032	ALL			ENTIRE SECTION
033	ALIQ			ALL;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 055757	240006	CLOSED	970	CASE CLOSED	11/20/2003		Total Acres = 3840
BIG HORN RIFLE		15 DIAMOND CIR		LAS VEGAS	NV	89106	100.00000 APPLICANT

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
021	ALIQ			E2;
028	ALIQ			E2;
033	ALIQ			E2;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 05575701	291200	CLOSED	970	CASE CLOSED	11/20/2003		Total Acres = 3840
BIG HORN RIFLE		15 DIAMOND CIR		LAS VEGAS	NV	89106	100.00000 APPLICANT

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
021	ALIQ			E2;
028	ALIQ			E2;
033	ALIQ			E2;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 058546	289001	PENDING	124	APLN RECD	03/02/1994		Total Acres = 3.636
LAS VEGAS PAIUTE TRIBE		#1 PAIUTE DR		LAS VEGAS	NV	89106	100.00000 APPLICANT

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Mer/Twp/Rng: **21 0180S 0600E**

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
019	LOTS			1-4;
030	LOTS			1-4;
031	LOTS			1-4;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 06644701	280004	AUTHORIZED	304	AUTH AMENDED/MODIFIED	08/01/2005		Total Acres = 6.56
NV POWER CO		PO BOX 98910		LAS VEGAS	NV	89151	100.00000 HOLDER/BILLEE

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
031	RSDL			SESE;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 076653	231145	AUTHORIZED	868	EFFECTIVE DATE	11/06/2002		Total Acres = 23334.16
BLM		4701 N TORREY PINES DR		LAS VEGAS	NV	891302301	100.00000 ADMIN MGT ENTITY

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
019	ALL			ENTIRE SECTION
020	ALL			ENTIRE SECTION
021	ALL			ENTIRE SECTION
028	ALL			ENTIRE SECTION
029	ALL			ENTIRE SECTION
030	ALL			ENTIRE SECTION
031	ALL			ENTIRE SECTION
032	ALL			ENTIRE SECTION
033	ALL			ENTIRE SECTION

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 077772	281001	PENDING	153	POST AUTH APLN RECD	12/08/2006	/B/	Total Acres = 2454.68
LAS VEGAS CITY OF		731 S 4TH ST		LAS VEGAS	NV	89101	100.00000 HOLDER

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Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
031	RSDL		01	SENESESE,SESWSESE;
031	RSDL		02	N2SESESE,S2SESESE;
032	RSDL		01	SENESESE;
032	RSDL		02	S2S2S2,SWNWSWSW;
033	RSDL		01	S2S2S2,SWNWSWSW;
033	RSDL		02	SENESESE;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 078142	281001	AUTHORIZED	307	ROW GRANTED-ISSUED	08/25/2004		Total Acres = 12.11
LAS VEGAS CITY OF		731 S 4TH ST		LAS VEGAS	NV	89101	100.00000 HOLDER

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
031	RSDL			SESESESE;
032	RSDL			S2S2S2S2S2;
033	RSDL			S2S2S2SW;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 083860	281001	PENDING	124	APLN RECD	07/11/2007		Total Acres = 35.68
LAS VEGAS CITY OF		731 S 4TH ST		LAS VEGAS	NV	89101	100.00000 APPLICANT

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
031	ALIQ			S2,S2SE;
032	ALIQ			NENW;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 08386001	281001	PENDING	124	APLN RECD	07/11/2007		Total Acres = 5.53
LAS VEGAS CITY OF		731 S 4TH ST		LAS VEGAS	NV	89101	100.00000 APPLICANT

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
031	ALIQ			SE;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 0055903	285002	AUTHORIZED	307	ROW GRANTED-ISSUED	10/14/1960		Total Acres = 68.56
NV POWER CO		PO BOX 98910		LAS VEGAS	NV	89151	100.00000 HOLDER/BILLEE

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Mer/Twp/Rng: 21 0180S 0600E

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
030	ALIQ			SESW;
030	LOTS			3,4;
031	ALIQ		01	SWNE,NENW,NESE;
031	ALIQ		02	SENE;
031	MNR		01	NWNWNE;
031	MNR		02	SWNWNE;
032	ALIQ			SWSW;

Mer/Twp/Rng: 21 0190S 0600E

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 029832	281001	AUTHORIZED	304	AUTH AMENDED/MODIFIED	06/01/1988	DATE CORRECTED	Total Acres = 27.5
LAS VEGAS CITY OF		400 STEWART AVE		LAS VEGAS	NV	89101	100.00000 HOLDER

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
003	LOTS			5,8,11,12,14,15;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 036876	240006	AUTHORIZED	868	EFFECTIVE DATE	10/23/1985	CLASSIFIED;	Total Acres = 1041.33
NV STATE		333 W NYE LN RM #118		CARSON CITY	NV	89710	100.00000 LESSEE

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
002	LOTS			5-20;
003	LOTS			5-15;
004	LOTS			5-7;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 03687601	291200	PENDING	153	POST AUTH APLN RECD	02/26/2004	/C/	Total Acres = 1041.33
NV STATE		333 W NYE LN RM #118		CARSON CITY	NV	89710	100.00000 LESSEE

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
002	LOTS			7-10,15-18;
003	LOTS			5-15;
004	LOTS			5-7;

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Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 036968	291200	CLOSED	970	CASE CLOSED	05/02/1983		Total Acres = 10
CLARK CNTY SCHOOL DIST		2832 E FLAMINGO RD		LAS VEGAS	NV	89121	100.00000 APPLICANT

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
002	ALIQ			NWSWSE;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 037206	287001	CLOSED	967	CLOSED WITHOUT ACTION	08/23/2000		Total Acres = 159.29
LAS VEGAS CITY OF		400 STEWART AVE		LAS VEGAS	NV	89101	100.00000 APPLICANT

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
002	LOTS			5,6,11,12;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 037207	287001	CLOSED	970	CASE CLOSED	04/26/2004		Total Acres = 40
LAS VEGAS CITY OF		400 STEWART AVE		LAS VEGAS	NV	89101	100.00000 APPLICANT

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
008	LOTS			10;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 037307	311111	CLOSED	970	CASE CLOSED	01/31/1983		Total Acres = 3451.56
DOLLY EDWARD D		1700 BROADWAY #2216		DENVER	CO	80290	33.33333 APPLICANT
FOSTER NORMAN H		1700 BROADWAY #2216		DENVER	CO	80290	33.33333 APPLICANT
OOMRIGAR J J		410 17TH ST #1720		DENVER	CO	80202	33.33333 APPLICANT

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
001	LOTS			5-16;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 037363	311111	CLOSED	970	CASE CLOSED	11/15/1982		Total Acres = 6200
EMERY ENERGY INC		225 N STATE ST		SALT LAKE CITY	UT	84103	0.00000 APPLICANT

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
001	LOTS			7,10;

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Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 039863	291100	CLOSED	970	CASE CLOSED	11/05/1987		Total Acres = 2579.51
GENERAL REC PROD		5695 GILBERT LN		LAS VEGAS	NV	89130	100.00000 APPLICANT

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
002	LOTS			5-20;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 042592	285003	AUTHORIZED	304	AUTH AMENDED/MODIFIED	05/08/2006	503-1.989,	Total Acres = 121.627
NV POWER CO		PO BOX 98910		LAS VEGAS	NV	89151	100.00000 HOLDER/BILLEE

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
001	LOTS			5-8,12,13,16;
002	LOTS			5-8;
003	LOTS			5-6;
004	LOTS			3,4;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 053584	287001	PENDING	153	POST AUTH APLN RECD	01/16/2003	/B/	Total Acres = 480.01
N LAS VEGAS CITY		2200 CIVIC CTR DR		N LAS VEGAS	NV	89030	100.00000 HOLDER

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
001	LOTS			5-16;
003	LOTS			5,6;
004	LOTS			5,6;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 054351	286207	AUTHORIZED	304	AUTH AMENDED/MODIFIED	05/08/2006	503-2.980,	Total Acres = 72.734
AF		5870 DEVLIN DR BLDG 595		NELLIS AFB	NV	89191	100.00000 HOLDER

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
001	LOTS			5-8;
002	LOTS			5-8;
003	LOTS			5,6;
004	LOTS			5,6;

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Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 060412	285003	AUTHORIZED	037	POST AUTH APLN WITHDRAWN	06/07/2004	/A/	Total Acres = 20
NV POWER CO		PO BOX 98910		LAS VEGAS	NV	89151	100.00000 HOLDER/BILLEE

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
001	LOTS			16;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 060475	285003	CLOSED	970	CASE CLOSED	08/11/1997		Total Acres = 5
NV POWER CO		PO BOX 98910		LAS VEGAS	NV	89151	100.00000 HOLDER/BILLEE

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
002	LOTS			17;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 061188	270030	CLOSED	967	CLOSED WITHOUT ACTION	03/01/2004		Total Acres = 5
NV POWER CO		PO BOX 98910		LAS VEGAS	NV	89151	100.00000 PROPONENT

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
002	LOTS			17;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 062830	291200	PENDING	153	POST AUTH APLN RECD	03/15/2007	/C/	Total Acres = 317.5
LAS VEGAS CITY OF		400 STEWART AVE		LAS VEGAS	NV	89101	100.00000 LESSEE

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
002	LOTS			5,6,11,12,13,14,19,20;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 06283001	274000	PENDING	387	CASE ESTABLISHED	06/03/1998		Total Acres = 320
LAS VEGAS CITY OF		400 STEWART AVE		LAS VEGAS	NV	89101	100.00000 LESSEE

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
002	LOTS			5,6,11,12,13,14,19,20;

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Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 062944	285001	CLOSED	970	CASE CLOSED	06/29/2004		Total Acres = 20
NV POWER CO		PO BOX 98910		LAS VEGAS	NV	89151	100.00000 APPLICANT

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
001	LOTS			16;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 066143	361113	CLOSED	970	CASE CLOSED	09/16/2000		Total Acres = 5
CONTRI CONSTRUCTION		BOX 12100		RENO	NV	89510	100.00000 CORPORATION

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
001	ALIQ			SESE;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 074201	361113	CLOSED	970	CASE CLOSED	12/12/2002		Total Acres = 5
CONTRI CONSTRUCTION		BOX 12100		RENO	NV	89510	100.00000 CORPORATION

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
001	ALIQ			SESE;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 075025	285003	AUTHORIZED	304	AUTH AMENDED/MODIFIED	05/08/2006	502-7178.545;	Total Acres = 730.14
NV POWER CO		PO BOX 98910		LAS VEGAS	NV	89151	100.00000 HOLDER/BILLEE

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
001	LOTS			7,8,10-13;
002	LOTS			5-8;
003	LOTS			5,6;
004	LOTS			3-6;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 07502501	280004	CLOSED	970	CASE CLOSED	01/29/2004		Total Acres = 59.01
NV POWER CO		PO BOX 98910		LAS VEGAS	NV	89151	100.00000 HOLDER/BILLEE

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Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
001	RSDL			N2NESE,SWSENE,NWNWNW;
002	RSDL			N2NENE;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 075060	286203	AUTHORIZED	304	AUTH AMENDED/MODIFIED	05/08/2006	503-0.973,(MILES)	Total Acres = 35.74
NV POWER CO		PO BOX 98910		LAS VEGAS	NV	89151	100.00000 HOLDER/BILLEE

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
001	LOTS			7,8,10-13;
002	LOTS			5-8;
003	LOTS			5,6;
004	LOTS			3-6;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 075426	280004	CLOSED	967	CLOSED WITHOUT ACTION	04/12/2004		Total Acres = 0.15
NV POWER CO		PO BOX 98910		LAS VEGAS	NV	89151	100.00000 APPLICANT

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
002	LOTS			5,8;
003	LOTS			6;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 075621	362113	CLOSED	970	CASE CLOSED	07/10/2003		Total Acres = 5
CLARK CNTY SCHOOL DIST		4828 S PEARL ST		LAS VEGAS	NV	89121	100.00000 APPLICANT

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
001	ALL			ENTIRE SECTION

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 076357	281001	AUTHORIZED	304	AUTH AMENDED/MODIFIED	05/01/2006	503-0.375; /C/	Total Acres = 34.665
NVN 076357	281001	AUTHORIZED	304	AUTH AMENDED/MODIFIED	05/01/2006	503-31514.680;	Total Acres = 34.665
N LAS VEGAS CITY		2200 CIVIC CTR DR		N LAS VEGAS	NV	89030	100.00000 HOLDER

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Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
001	LOTS			5,12,13,16;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 07635701	280004	CLOSED	970	CASE CLOSED	05/30/2007		Total Acres = 6.97
N LAS VEGAS CITY		2200 CIVIC CTR DR		N LAS VEGAS	NV	89030	100.00000 HOLDER

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
001	LOTS			5,12,13,16;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 076432	286203	PENDING	153	POST AUTH APLN RECD	05/01/2007	/C/	Total Acres = 39.704
NV POWER CO		PO BOX 98910		LAS VEGAS	NV	89151	100.00000 HOLDER/BILLEE

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
001	LOTS			5-8;
002	LOTS			5-8;
003	LOTS			5,6;
004	LOTS			5,6;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 076844	285003	AUTHORIZED	307	ROW GRANTED-ISSUED	11/17/2003		Total Acres = 1.9
NV POWER CO		PO BOX 98910		LAS VEGAS	NV	89151	100.00000 HOLDER/BILLEE

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
001	LOTS			15,16;
002	LOTS			19,20;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 07684401	280004	CLOSED	970	CASE CLOSED	07/08/2004		Total Acres = 4
NV POWER CO		PO BOX 98910		LAS VEGAS	NV	89151	100.00000 HOLDER/BILLEE

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
001	LOTS			15,16;
002	LOTS			19,20;

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Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 076980	281001	PENDING	124	APLN RECD	04/07/2003		Total Acres = 2.52
LAS VEGAS CITY OF		731 S 4TH ST		LAS VEGAS	NV	89101	100.00000 APPLICANT

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
001	LOTS			16;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 077492	281001	AUTHORIZED	307	ROW GRANTED-ISSUED	01/16/2004		Total Acres = 1.6
LAS VEGAS CITY OF		731 S 4TH ST		LAS VEGAS	NV	89101	100.00000 HOLDER

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
002	LOTS			20;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 077519	281001	PENDING	124	APLN RECD	08/19/2003		Total Acres = 3.787
LAS VEGAS CITY OF		731 S 4TH ST		LAS VEGAS	NV	89101	100.00000 APPLICANT

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
001	LOTS			15-16;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 077772	281001	PENDING	153	POST AUTH APLN RECD	12/08/2006	/B/	Total Acres = 2454.68
LAS VEGAS CITY OF		731 S 4TH ST		LAS VEGAS	NV	89101	100.00000 HOLDER

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
001	RSDL			N2NENENE,NWNWNWNW;
002	RSDL			NENENENE;
003	RSDL			NWNWNWNW;
004	RSDL			NENENENE,NWNWNWNW;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 078438	286203	AUTHORIZED	307	ROW GRANTED-ISSUED	01/30/2007		Total Acres = 1.1
COX COMMUNICATIONS		121 MARTIN LUTHER KING BLVD		LAS VEGAS	NV	89106	100.00000 HOLDER/BILLEE

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Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
001	LOTS			15,16;
002	LOTS			20;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark
NVN 07843801	280004	AUTHORIZED	307	ROW GRANTED-ISSUED	01/30/2007	Total Acres = 2.75
COX COMMUNICATIONS		121 MARTIN LUTHER KING BLVD		LAS VEGAS	NV 89106	100.00000 HOLDER/BILLEE

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
001	LOTS			15,16;
002	LOTS			20;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark
NVN 078462	240006	PENDING	124	APLN RECD	04/21/2004	Total Acres = 80
LAS VEGAS CITY OF		400 STEWART AVE		LAS VEGAS	NV 89101	100.00000 APPLICANT

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
001	LOTS			15,16;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark
NVN 07846201	291200	PENDING	124	APLN RECD	04/21/2004	Total Acres = 80
LAS VEGAS CITY OF		400 STEWART AVE		LAS VEGAS	NV 89101	100.00000 APPLICANT

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
001	LOTS			15,16;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark
NVN 078969	288001	CLOSED	967	CLOSED WITHOUT ACTION	01/13/2005	Total Acres = 5.44
LAS VEGAS CITY OF		731 S 4TH ST		LAS VEGAS	NV 89101	100.00000 APPLICANT

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
001	LOTS			9;
002	LOTS			9-12;
003	LOTS			7-10;
004	LOTS			4;

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Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 079490	292006	CLOSED	970	CASE CLOSED	03/30/2005		Total Acres = 80
VEGAS BABY PRODUCTIONS		116 S 1ST ST		LAS VEGAS	NV	89101	100.00000 PERMITTEE

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
001	ALIQ		01	S2,NW;
002	ALIQ		02	S2,NE;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 082655	281001	AUTHORIZED	307	ROW GRANTED-ISSUED	01/18/2007		Total Acres = 1.15
LAS VEGAS CITY OF		400 STEWART AVE		LAS VEGAS	NV	89101	100.00000 HOLDER

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
002	LOTS			20;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 083258	285003	PENDING	124	APLN RECD	04/10/2007		Total Acres = 2.03
NV POWER CO		PO BOX 98910		LAS VEGAS	NV	89151	100.00000 APPLICANT

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
001	ALIQ			NWNW;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 083281	291200	PENDING	387	CASE ESTABLISHED	03/15/2007		Total Acres = 2.5
LAS VEGAS CITY OF		400 STEWART AVE		LAS VEGAS	NV	89101	100.00000 APPLICANT

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
002	RSDL			SWSWSESE;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 08328101	274000	PENDING	387	CASE ESTABLISHED	03/15/2007		Total Acres = 2.5
LAS VEGAS CITY OF		400 STEWART AVE		LAS VEGAS	NV	89101	100.00000 APPLICANT

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
002	RSDL			SWSWSESE;

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Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 019804	311111	CLOSED	970	CASE CLOSED	01/02/1997		Total Acres = 1590.97
TEXACO INC		PO BOX 2100		DENVER	CO	80201	100.00000 LESSEE

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
004	ALIQ			S2N2,S2;
004	LOTS			1-4;
005	ALIQ			S2N2,S2;
005	LOTS			1-4;
006	LOTS			8-15;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 019806	311111	CLOSED	970	CASE CLOSED	01/02/1997		Total Acres = 320
TEXACO INC		PO BOX 2100		DENVER	CO	80201	100.00000 LESSEE

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
009	ALIQ			N2;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 019807	311111	CLOSED	970	CASE CLOSED	01/02/1997		Total Acres = 2560
TEXACO INC		PO BOX 2100		DENVER	CO	80201	0.00000 LESSEE

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
010	ALIQ			ALL;
015	ALIQ			ALL;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 019819	311111	CLOSED	970	CASE CLOSED	09/01/1991		Total Acres = 757.8
LOUISIANA LAND & EXPL		1560 BROADWAY #1200		DENVER	CO	80202	100.00000 LESSEE

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
003	ALIQ			S2N2,S2;
003	LOTS			1-4;

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Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 036864	287001	CLOSED	970	CASE CLOSED	05/08/2006		Total Acres = 368
N LAS VEGAS CITY		2200 CIVIC CTR DR		N LAS VEGAS	NV	89030	100.00000 HOLDER

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
015	LOTS			7-10;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 037307	311111	CLOSED	970	CASE CLOSED	01/31/1983		Total Acres = 3451.56
DOLLY EDWARD D		1700 BROADWAY #2216		DENVER	CO	80290	33.33333 APPLICANT
FOSTER NORMAN H		1700 BROADWAY #2216		DENVER	CO	80290	33.33333 APPLICANT
OOMRIGAR J J		410 17TH ST #1720		DENVER	CO	80202	33.33333 APPLICANT

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
006	ALIQ			SESW,S2SE;
006	LOTS			7,16-19;
007	ALIQ			N2NE,NENW;
007	LOTS			1,5-8;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 037308	311111	CLOSED	970	CASE CLOSED	01/31/1983		Total Acres = 4280
DOLLY EDWARD D		1700 BROADWAY #2216		DENVER	CO	80290	33.33333 APPLICANT
FOSTER NORMAN H		1700 BROADWAY #2216		DENVER	CO	80290	33.33333 APPLICANT
OOMRIGAR J J		410 17TH ST #1720		DENVER	CO	80202	33.33333 APPLICANT

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
008	ALIQ			ALL;
009	ALIQ			S2;
016	ALIQ			ALL;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 037363	311111	CLOSED	970	CASE CLOSED	11/15/1982		Total Acres = 6200
EMERY ENERGY INC		225 N STATE ST		SALT LAKE CITY	UT	84103	0.00000 APPLICANT

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Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
006	ALIQ			SESW,S2SE;
006	LOTS			7,16-19;
007	ALIQ			N2NE,NENW;
007	LOTS			1,5-8;
008	ALL			ENTIRE SECTION
009	ALIQ			S2;
016	ALL			ENTIRE SECTION

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 042592	285003	AUTHORIZED	304	AUTH AMENDED/MODIFIED	05/08/2006	503-1.989;	Total Acres = 121.627
NV POWER CO		PO BOX 98910		LAS VEGAS	NV	89151	100.00000 HOLDER/BILLEE

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
015	LOTS			3,22,23;
016	LOTS			30,32;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 042793	181050	CLOSED	967	CLOSED WITHOUT ACTION	10/07/1991		Total Acres = 235
HOPKINS AMOS ABE		RT 1 BOX 128 A		ELGIN	OK	73538	100.00000 PLAINTIFF

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
004	ALIQ			SE;
009	ALIQ			NE;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 048649	281001	CLOSED	970	CASE CLOSED	02/09/1990		Total Acres = 268.6
N LAS VEGAS CITY		2200 CIVIC CTR DR		N LAS VEGAS	NV	89030	100.00000 APPLICANT

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
015	ALIQ			S2;
016	ALIQ			S2;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 049747	240006	AUTHORIZED	868	EFFECTIVE DATE	05/30/1989	CLASSIFIED;	Total Acres = 163.08

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N LAS VEGAS CITY 2200 CIVIC CTR DR N LAS VEGAS NV 89030 100.00000 LESSEE

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
007	LOTS			5-8;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 04974701	291200	AUTHORIZED	242	LEASE RENEWED	08/01/2007	/G/	Total Acres = 163.08

N LAS VEGAS CITY 2200 CIVIC CTR DR N LAS VEGAS NV 89030 100.00000 LESSEE

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
007	LOTS			5-8;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 050469	271000	CLOSED	967	CLOSED WITHOUT ACTION	05/10/1990	/A/;	Total Acres = 7488.53

BLM 4701 N TORREY PINES DR LAS VEGAS NV 891302301 100.00000 ADMIN MGT ENTITY

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
015	ALL			ENTIRE SECTION
016	ALL			ENTIRE SECTION

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 053110	271000	CLOSED	967	CLOSED WITHOUT ACTION	03/05/1991	/A/;	Total Acres = 7488.53

BLM 4701 N TORREY PINES DR LAS VEGAS NV 891302301 100.00000 AGENCY

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
015	ALL			ENTIRE SECTION
016	ALL			ENTIRE SECTION

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 053347	393001	CLOSED	970	CASE CLOSED	05/14/1991		Total Acres = 80

INGALLS RONALD G 801 CALLE DE JULIO GREEN VALLEY AZ 85614 100.00000 CONTESTEE
N LAS VEGAS CITY 2200 CIVIC CTR DR N LAS VEGAS NV 89030 100.00000 CONTESTANT

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
016	RSDL			S2NWSW,S2SWSE;

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Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 053348	393001	CLOSED	970	CASE CLOSED	05/14/1991	KMW	Total Acres = 160

COLUMBUS MINERALS	BOX 308	PHOENIX	AZ	85001	100.00000	CONTESTEE
HUCZEL MARK D	BOX 308	PHOENIX	AZ	85001	100.00000	CONTESTEE
N LAS VEGAS CITY	2200 CIVIC CTR DR	N LAS VEGAS	NV	89030	100.00000	CONTESTANT

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
016	MNR			S2SESE,N2SESE,
016	MNR		01	S2NESE,N2NESE,

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 054229	272000	CLOSED	967	CLOSED WITHOUT ACTION	12/16/1992	/D/;	Total Acres = 7534.27

BLM	4701 N TORREY PINES DR	LAS VEGAS	NV	891302301	100.00000	AGENCY

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
015	ALL			ENTIRE SECTION
016	ALL			ENTIRE SECTION

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 055291	271000	CLOSED	967	CLOSED WITHOUT ACTION	09/26/1992	/A/;	Total Acres = 7534.27

BLM	4701 N TORREY PINES DR	LAS VEGAS	NV	891302301	100.00000	AGENCY

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
015	ALL			ENTIRE SECTION
016	ALL			ENTIRE SECTION

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 056356	271000	CLOSED	970	CASE CLOSED	12/16/1992		Total Acres = 7534.27

BLM	4701 N TORREY PINES DR	LAS VEGAS	NV	891302301	100.00000	AGENCY

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
015	ALL			ENTIRE SECTION
016	ALL			ENTIRE SECTION

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 057477	271000	CLOSED	970	CASE CLOSED	12/16/1992		Total Acres = 7534.27

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BLM 4701 N TORREY PINES DR LAS VEGAS NV 891302301 100.00000 AGENCY

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
015	ALL			ENTIRE SECTION
016	ALL			ENTIRE SECTION

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark
NVN 057877FD	220100	CLOSED	970	CASE CLOSED	05/09/2006	Total Acres = 11621.23

BLM 4701 N TORREY PINES DR LAS VEGAS NV 891302301 100.00000 ADMIN MGT ENTITY

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
015	LOTS			1-16;
016	LOTS			1-16;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark
NVN 057887FD	220100	CLOSED	970	CASE CLOSED	10/15/1996	Total Acres = 7534.27

BLM 5100 E WINNEMUCCA BLVD WINNEMUCCA NV 89445 100.00000 ADMIN MGT ENTITY
CASEY JOHN J 2905 S VIRGINIA ST RENO NV 89502 100.00000 PATENTEE

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
015	ALL			ENTIRE SECTION
016	ALL			ENTIRE SECTION

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark
NVN 058873	240006	CLOSED	970	CASE CLOSED	02/23/2006	Total Acres = 15

CLARK CNTY SCHOOL DIST 2832 E FLAMINGO RD LAS VEGAS NV 89121 100.00000 APPLICANT

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
016	LOTS			7;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark
NVN 05887301	291200	CLOSED	970	CASE CLOSED	05/18/2004	Total Acres = 15

CLARK CNTY SCHOOL DIST 2832 E FLAMINGO RD LAS VEGAS NV 89121 100.00000 APPLICANT

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
016	LOTS			7;

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Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 058874	240006	CLOSED	970	CASE CLOSED	02/23/2006		Total Acres = 20
CLARK CNTY SCHOOL DIST		2832 E FLAMINGO RD		LAS VEGAS	NV	89121	100.00000 APPLICANT

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
015	LOTS			11;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 05887401	291200	CLOSED	970	CASE CLOSED	05/18/2004		Total Acres = 20
CLARK CNTY SCHOOL DIST		2832 E FLAMINGO RD		LAS VEGAS	NV	89121	100.00000 APPLICANT

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
015	LOTS			11;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 059611	281001	AUTHORIZED	304	AUTH AMENDED/MODIFIED	05/08/2006	502-5353.00;	Total Acres = 14.556
N LAS VEGAS CITY		2200 CIVIC CTR DR		N LAS VEGAS	NV	89030	100.00000 HOLDER

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
007	LOTS			5;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 060073FD	220100	PENDING	387	CASE ESTABLISHED	08/21/1995		Total Acres = 9971.51
BLM		4701 N TORREY PINES DR		LAS VEGAS	NV	891302301	100.00000 ADMIN MGT ENTITY

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
015	LOTS			1-16;
016	LOTS			1-16;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 061323	281001	AUTHORIZED	304	AUTH AMENDED/MODIFIED	02/01/2007	502-660.00;	Total Acres = 2428.529
CLARK CNTY		PO BOX 554000		LAS VEGAS	NV	89155	100.00000 HOLDER

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
016	LOTS			23;

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Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 062372	285003	CLOSED	970	CASE CLOSED	06/30/2004		Total Acres = 103.03
NV POWER CO		PO BOX 98910		LAS VEGAS	NV	89151	100.00000 APPLICANT

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
006	LOTS			16,17,18,19;
008	LOTS			4,5,12,13;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 065720	287001	AUTHORIZED	307	ROW GRANTED-ISSUED	11/30/1999		Total Acres = 0.337
SOUTHERN NV WATER AUTHORITY		1900 E FLAMINGO #170		LAS VEGAS	NV	89119	100.00000 HOLDER

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
007	RSDL			S2S2S2N2;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 065969	240006	CLOSED	967	CLOSED WITHOUT ACTION	06/01/2005		Total Acres = 810
N LAS VEGAS CITY		2200 CIVIC CTR DR		N LAS VEGAS	NV	89030	100.00000 APPLICANT

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
015	LOTS			1-3,6-10;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 066216	292006	CLOSED	970	CASE CLOSED	07/15/2000		Total Acres = 1
SOUTHERN NV WATER AUTHORITY		1900 E FLAMINGO #170		LAS VEGAS	NV	89119	100.00000 APPLICANT

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
008	LOTS			13-16;
009	LOTS			13-16;
010	LOTS			13-16;
015	LOTS			1-4;
016	LOTS			1-4;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 066225	287001	AUTHORIZED	304	AUTH AMENDED/MODIFIED	03/05/2002		Total Acres = 35.57

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SOUTHERN NV WATER AUTHORITY 1900 E FLAMINGO #170 LAS VEGAS NV 89119 100.00000 HOLDER

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
008	FF			PORTION OF LOT 13;
008	LOTS			14-16;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark
NVN 073752	270030	AUTHORIZED	271	PATENT ISSUED	01/07/2002	27-2002-0015;

Total Acres = 1905.08

NORTH VALLEY ENTERPRISES LLC 901 N GREEN VALLEY PKWY #200 HENDERSON NV 89014 100.00000 PATENTEE

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
016	LOTS			23;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark
NVN 07457701	280004	CLOSED	970	CASE CLOSED	08/11/2005	

Total Acres = 16.62

SOUTHERN NV WATER AUTHORITY 1900 E FLAMINGO #170 LAS VEGAS NV 89119 HOLDER

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
007	LOTS			5;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark
NVN 075025	285003	AUTHORIZED	304	AUTH AMENDED/MODIFIED	05/08/2006	502-7178.545;

Total Acres = 730.14

NV POWER CO PO BOX 98910 LAS VEGAS NV 89151 100.00000 HOLDER/BILLEE

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
006	LOTS			16-19;
008	LOTS			3,4,6-9;
009	LOTS			11,12,14-16;
015	LOTS			3,22,23;
016	LOTS			1;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark
NVN 07502501	280004	CLOSED	970	CASE CLOSED	01/29/2004	

Total Acres = 59.01

NV POWER CO PO BOX 98910 LAS VEGAS NV 89151 100.00000 HOLDER/BILLEE

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Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
006	RSDL			NWNWSW;
009	ALIQ			SESE;
010	RSDL			SWSWSW;
015	RSDL			W2NWNW;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark		
NVN 075060	286203	AUTHORIZED	304	AUTH AMENDED/MODIFIED	05/08/2006	503-0.973,(MILES)		Total Acres = 35.74
NV POWER CO		PO BOX 98910		LAS VEGAS	NV	89151	100.00000	HOLDER/BILLEE

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
006	LOTS			16-19;
008	LOTS			3,4,6-9;
009	LOTS			11,12,14-16;
015	LOTS			1-4;
016	LOTS			1;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark		
NVN 075413	287001	CLOSED	970	CASE CLOSED	12/10/2002			Total Acres = 0.46
MMC INC		408 E GOWAN RD		LAS VEGAS	NV	89030	100.00000	HOLDER/BILLEE

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
015	LOTS			15;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark		
NVN 075426	280004	CLOSED	967	CLOSED WITHOUT ACTION	04/12/2004			Total Acres = 0.15
NV POWER CO		PO BOX 98910		LAS VEGAS	NV	89151	100.00000	APPLICANT

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
015	LOTS			1,4;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark		
NVN 076304	286203	AUTHORIZED	307	ROW GRANTED-ISSUED	03/18/2004			Total Acres = 0.07
NV POWER CO		PO BOX 98910		LAS VEGAS	NV	89151	100.00000	HOLDER/BILLEE

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Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
008	LOTS			13;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 076305	285001	AUTHORIZED	307	ROW GRANTED-ISSUED	03/18/2004		Total Acres = 6.05
NV POWER CO		PO BOX 98910		LAS VEGAS	NV	89151	100.00000 HOLDER/BILLEE

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
008	LOTS			13;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 07630501	280004	AUTHORIZED	242	LEASE RENEWED	03/15/2006		Total Acres = 1.82
NV POWER CO		PO BOX 98910		LAS VEGAS	NV	89151	100.00000 HOLDER/BILLEE

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
008	LOTS			13;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 07630502	270037	CLOSED	967	CLOSED WITHOUT ACTION	08/24/2007		Total Acres = 6.05
NV POWER CO		PO BOX 98910		LAS VEGAS	NV	89151	100.00000 HOLDER/BILLEE

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
008	LOTS			13;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 076357	281001	AUTHORIZED	304	AUTH AMENDED/MODIFIED	05/01/2006	503 -0.375; /C/	Total Acres = 34.665
NVN 076357	281001	AUTHORIZED	304	AUTH AMENDED/MODIFIED	05/01/2006	503-31514.680;	Total Acres = 34.665
N LAS VEGAS CITY		2200 CIVIC CTR DR		N LAS VEGAS	NV	89030	100.00000 HOLDER

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
007	LOTS			5;
008	LOTS			13-16;
016	LOTS			4;

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Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark		
NVN 07635701	280004	CLOSED	970	CASE CLOSED	05/30/2007			Total Acres = 6.97
N LAS VEGAS CITY		2200 CIVIC CTR DR		N LAS VEGAS	NV	89030	100.00000	HOLDER

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
007	LOTS			5;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark		
NVN 076432	286203	PENDING	153	POST AUTH APLN RECD	05/01/2007	/C/		Total Acres = 39.704
NV POWER CO		PO BOX 98910		LAS VEGAS	NV	89151	100.00000	HOLDER/BILLEE

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
015	LOTS			3,22,23;
016	LOTS			30,32;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark		
NVN 076653	231145	AUTHORIZED	868	EFFECTIVE DATE	11/06/2002			Total Acres = 23334.16
BLM		4701 N TORREY PINES DR		LAS VEGAS	NV	891302301	100.00000	ADMIN MGT ENTITY

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
003	LOTS			5-20;
004	LOTS			5-20;
005	LOTS			5-20;
006	LOTS			8-19;
008	LOTS			1-16;
009	LOTS			1-16;
010	LOTS			1-16;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark		
NVN 077547	285003	CLOSED	970	CASE CLOSED	05/08/2006			Total Acres = 1.763
NV POWER CO		PO BOX 98910		LAS VEGAS	NV	89151	100.00000	HOLDER/BILLEE

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
016	LOTS			12,22;

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Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 077675	286203	AUTHORIZED	304	AUTH AMENDED/MODIFIED	05/08/2006	502-26077.070;	Total Acres = 1.114
CENTRAL TELEPHONE CO		330 S VALLEY VIEW BLVD		LAS VEGAS	NV	89152	100.00000 HOLDER/BILLEE

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
008	LOTS			13,14,15,16;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 077736	362113	AUTHORIZED	276	PMT-LIC ISSUED	04/05/2004		Total Acres = 80
N LAS VEGAS CITY OF		2266 CIVIC CTR DR		LAS VEGAS	NV	89030	100.00000 APPLICANT

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
015	ALL			ENTIRE SECTION

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 077772	281001	PENDING	153	POST AUTH APLN RECD	12/08/2006	/B/	Total Acres = 2454.68
LAS VEGAS CITY OF		731 S 4TH ST		LAS VEGAS	NV	89101	100.00000 HOLDER

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
003	LOTS			17-20;
004	LOTS			17-20;
005	LOTS			9,14-20;
006	LOTS			8-11,13-16;
008	LOTS			1,2;
009	LOTS			1-4;
010	LOTS			1-4;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 077820	287001	PENDING	153	POST AUTH APLN RECD	12/20/2006	/A/	Total Acres = 15.19
N LAS VEGAS CITY		2200 CIVIC CTR DR		N LAS VEGAS	NV	89030	100.00000 HOLDER

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
006	LOTS			11,12,19;

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Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 077938	281001	CLOSED	970	CASE CLOSED	05/22/2007		Total Acres = 5.578
N LAS VEGAS CITY		2200 CIVIC CTR DR		N LAS VEGAS	NV	89030	100.00000 APPLICANT

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
007	LOTS			7,8;
008	LOTS			12,13;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 078217	270030	AUTHORIZED	271	PATENT ISSUED	05/08/2006	27-2006-0097;	Total Acres = 2675.3
NOV 2005 LAND INVSTR LLC		11411 STHRN HIGHLANDS PKWY		ENCINO	CA	91436	100.00000 PATENTEE

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
015	LOTS			28,30,31,33,35,36,38,39;
015	LOTS			13-15,17-19,21,24,25,26;
015	LOTS			41,43,45;
016	LOTS			29,31,33,34,37,39,41,42;
016	LOTS			5,9-12,14-16,19,21,22,25;
016	LOTS			27,44;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 078787	285001	CLOSED	970	CASE CLOSED	10/25/2005		Total Acres = 5.19
NV POWER CO		PO BOX 98910		LAS VEGAS	NV	89151	100.00000 APPLICANT

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
015	LOTS			1;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 07878701	280004	CLOSED	970	CASE CLOSED	10/25/2005		Total Acres = 5.19
NV POWER CO		PO BOX 98910		LAS VEGAS	NV	89151	100.00000 APPLICANT

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
015	LOTS			1;

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Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 078789	286203	CLOSED	970	CASE CLOSED	10/25/2005		Total Acres = 5.19
NV POWER CO		PO BOX 98910		LAS VEGAS	NV	89151	100.00000 APPLICANT

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
015	LOTS			11;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 07878901	280004	CLOSED	967	CLOSED WITHOUT ACTION	07/07/2004		Total Acres = 5.19
NV POWER CO		PO BOX 98910		LAS VEGAS	NV	89151	100.00000 APPLICANT

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
015	LOTS			11;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 078790	285003	CLOSED	970	CASE CLOSED	10/25/2005		Total Acres = 7.27
NV POWER CO		PO BOX 98910		LAS VEGAS	NV	89151	100.00000 APPLICANT

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
015	LOTS			3,6;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 07879001	280004	CLOSED	967	CLOSED WITHOUT ACTION	07/09/2004		Total Acres = 7.27
NV POWER CO		PO BOX 98910		LAS VEGAS	NV	89151	100.00000 APPLICANT

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
015	LOTS			3,6;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 078848	288100	CLOSED	967	CLOSED WITHOUT ACTION	05/04/2005		Total Acres = 0.02
SOUTHWEST GAS CORP		PO BOX 98510		LAS VEGAS	NV	891938510	100.00000 APPLICANT

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
008	LOTS			13;

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Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark		
NVN 07884801	280004	CLOSED	967	CLOSED WITHOUT ACTION	05/04/2005			Total Acres = 0.01
SOUTHWEST GAS CORP		PO BOX 98510		LAS VEGAS	NV	891938510	100.00000	APPLICANT

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
008	LOTS			13;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark		
NVN 080965	285003	AUTHORIZED	307	ROW GRANTED-ISSUED	12/16/2005			Total Acres = 0.25
NV POWER CO		PO BOX 98910		LAS VEGAS	NV	89151	100.00000	HOLDER/BILLEE

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
007	LOTS			5;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark		
NVN 082313	286203	AUTHORIZED	307	ROW GRANTED-ISSUED	08/30/2006			Total Acres = 0.147
CENTRAL TELEPHONE CO		6391 SPRINT PKWY		OVERLAND PARK	KS	66251	100.00000	HOLDER/BILLEE

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
007	LOTS			5;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark		
NVN 08231301	280004	EXPIRED	234	EXPIRED	09/30/2007			Total Acres = 0.147
CENTRAL TELEPHONE CO		6391 SPRINT PKWY		OVERLAND PARK	KS	66251	100.00000	HOLDER/BILLEE

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
007	LOTS			5;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark		
NVN 082428	270037	CLOSED	967	CLOSED WITHOUT ACTION	07/17/2007			Total Acres = 6.05
NV POWER CO		PO BOX 98910		LAS VEGAS	NV	89151	100.00000	PATENTEE

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
008	LOTS			13;

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Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 083272	285003	CLOSED	970	CASE CLOSED	05/03/2007		Total Acres = 10
NV POWER CO		PO BOX 98910		LAS VEGAS	NV	89151	100.00000 APPLICANT

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
015	LOTS			3,22,23;
016	LOTS			24,30,32;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 08327201	285003	CLOSED	970	CASE CLOSED	05/03/2007		Total Acres = 10
NV POWER CO		PO BOX 98910		LAS VEGAS	NV	89151	100.00000 APPLICANT

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
015	LOTS			3,22,23;
016	LOTS			24,30,32;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 083310	281001	AUTHORIZED	307	ROW GRANTED-ISSUED	05/21/2007		Total Acres = 31.08
N LAS VEGAS CITY OF		2266 CIVIC CTR DR		LAS VEGAS	NV	89030	100.00000 HOLDER

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
009	LOTS			13,14,15,16;
010	LOTS			15,16;
015	LOTS			3,22,23;
016	LOTS			24,30,32;

Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark	
NVN 08331001	281001	AUTHORIZED	307	ROW GRANTED-ISSUED	05/21/2007		Total Acres = 4.99
N LAS VEGAS CITY OF		2266 CIVIC CTR DR		LAS VEGAS	NV	89030	100.00000 HOLDER

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
009	LOTS			13,14,15,16;
010	LOTS			15,16;
015	LOTS			3,22,23;
016	LOTS			24,30,32;

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Serial Number	Casetype	Disposition	Actn Code	Actn Txt	Date	Actn Remark
NVN 083621	271000	PENDING	124	APLN RECD	12/11/2006	Total Acres = 5
NV POWER CO		PO BOX 98910		LAS VEGAS	NV 89151	100.00000 APPLICANT

Section	TYP	Sur Nr	Sur Suffix	Aliquot Part
008	LOTS			13;

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Appendix H

BLM LAND AND MINERAL RESOURCES LR2000 PUBLIC RECORDS DATABASE SEARCH RESULTS:
ALL MINING CLAIM RECORDS

Run Time: 11:00 AM

UNITED STATES DEPARTMENT OF INTERIOR
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MINING CLAIM GEOGRAPHIC INDEX REPORT

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Geo State: NV County: CLARK

BLM Resource Area: LAS VEGAS FIELD OFFICE

Meridian Township Range: 21 0180S 0590E

SEC	SUB DV	Ser No	Case Type	Claim Name/Number	Claimant	Lead File	County Book:Page	Loc Dt	Latest Assmt-Yr	Closed Date
022	NE	NMC93821	PLACER	VEGA 222	VEGA INC	NMC93820		05/21/1971	1992	09/01/1994
	NW	NMC93820	PLACER	VEGA 221	VEGA INC	NMC93820		05/21/1971	1992	09/01/1994
	SE	NMC93822	PLACER	VEGA 2234	VEGA INC	NMC93820		05/21/1971	1992	09/01/1994
	SW	NMC93823	PLACER	VEGA 233	VEGA INC	NMC93820		05/21/1971	1992	09/01/1994
023	SE	NMC93824	PLACER	VEGA 2314	VEGA INC	NMC93820		05/21/1971	1992	09/01/1994
024	NE	NMC93826	PLACER	VEGA 2412	VEGA INC	NMC93820		05/21/1971	1992	09/01/1994
	NE	NMC93827	PLACER	VEGA 2421	VEGA INC	NMC93820		05/21/1971	1992	09/01/1994
	NW	NMC93825	PLACER	VEGA 2321	VEGA INC	NMC93820		05/21/1971	1992	09/01/1994
	SE	NMC93829	PLACER	VEGA 244	VEGA INC	NMC93820		05/21/1971	1992	09/01/1994
	SW	NMC93828	PLACER	VEGA 243	VEGA INC	NMC93820		05/21/1971	1992	09/01/1994

Meridian Township Range: 21 0180S 0600E

SEC	SUB DV	Ser No	Case Type	Claim Name/Number	Claimant	Lead File	County Book:Page	Loc Dt	Latest Assmt-Yr	Closed Date
030	NE	NMC93837	PLACER	VEGA 302	VEGA INC	NMC93820		05/21/1971	1992	09/01/1994
	NW	NMC93836	PLACER	VEGA 301	VEGA INC	NMC93820		05/21/1971	1992	09/01/1994
	SE	NMC93839	PLACER	VEGA 304	VEGA INC	NMC93820		05/21/1971	1992	09/01/1994
	SW	NMC93838	PLACER	VEGA 303	VEGA INC	NMC93820		05/21/1971	1992	09/01/1994
031	NE	NMC93841	PLACER	VEGA 312	VEGA INC	NMC93820		05/21/1971	1992	09/01/1994
	NW	NMC93840	PLACER	VEGA 311	VEGA INC	NMC93820		05/21/1971	1992	09/01/1994
	SE	NMC93843	PLACER	VEGA 314	VEGA INC	NMC93820		05/21/1971	1992	09/01/1994
	SW	NMC93842	PLACER	VEGA 313	VEGA INC	NMC93820		05/21/1971	1992	09/01/1994
032	NW	NMC93844	PLACER	VEGA 321	VEGA INC	NMC93820		05/21/1971	1992	09/01/1994
	SE	NMC93846	PLACER	VEGA 324	VEGA INC	NMC93820		05/21/1971	1992	09/01/1994
	SW	NMC93845	PLACER	VEGA 323	VEGA INC	NMC93820		05/21/1971	1992	09/01/1994

Meridian Township Range: 21 0190S 0610E

SEC	SUB DV	Ser No	Case Type	Claim Name/Number	Claimant	Lead File	County Book:Page	Loc Dt	Latest Assmt-Yr	Closed Date
016	SE	NMC562827	PLACER	ORO #13	CITY OF N LAS VEGAS	NMC552815	890717;00709	07/14/1989	0000	01/22/1991
	SE	NMC562828	PLACER	ORO #14	CITY OF N LAS VEGAS	NMC552815	890717;00711	07/14/1989	0000	01/22/1991
	SE	NMC562829	PLACER	ORO #15	CITY OF N LAS VEGAS	NMC552815	890717;00713	07/14/1989	0000	01/22/1991

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Meridian Township Range: 21 0190S 0610E

SEC	SUB DV	Ser No	Case Type	Claim Name/Number	Claimant	Lead File	County Book:Page	Loc Dt	Latest Assmt-Yr	Closed Date
	SE	NMC562830	PLACER	ORO #16	CITY OF N LAS VEGAS	NMC562815	890717:00715	07/14/1989	0000	01/22/1991
	SE	NMC575137	PLACER	PLACER # 16	CITY OF N LAS VEGAS	NMC575132		08/10/1989	0000	08/14/1991
	SW	NMC575136	PLACER	PLACER # 15	CITY OF N LAS VEGAS	NMC575132		08/10/1989	0000	08/14/1991

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Appendix I

BLM LAND AND MINERAL RESOURCES LR2000 PUBLIC RECORDS DATABASE SEARCH RESULTS:
CLOSED MINING CLAIM RECORDS

Run Time: 11:06 AM

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
MINING CLAIM GEOGRAPHIC REPORT
LIST OF MINING CLAIMS BY SECTION

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MER TWP RNG SEC
21 0180S 0590E 022

Serial Num	Quad	Claim Name/Number	Claimant(s)	Lead File	Case Type	Status	Loc Dt	Last Assessment
NMC93820	NW	VEGA 221	VEGA INC	NMC93820	384201	CLOSED	05/21/1971	1992
NMC93821	NE	VEGA 222	VEGA INC	NMC93820	384201	CLOSED	05/21/1971	1992
NMC93822	SE	VEGA 2234	VEGA INC	NMC93820	384201	CLOSED	05/21/1971	1992
NMC93823	SW	VEGA 233	VEGA INC	NMC93820	384201	CLOSED	05/21/1971	1992

MER TWP RNG SEC
21 0180S 0590E 023

Serial Num	Quad	Claim Name/Number	Claimant(s)	Lead File	Case Type	Status	Loc Dt	Last Assessment
NMC93824	SE	VEGA 2314	VEGA INC	NMC93820	384201	CLOSED	05/21/1971	1992

MER TWP RNG SEC
21 0180S 0590E 024

Serial Num	Quad	Claim Name/Number	Claimant(s)	Lead File	Case Type	Status	Loc Dt	Last Assessment
NMC93825	NW	VEGA 2321	VEGA INC	NMC93820	384201	CLOSED	05/21/1971	1992
NMC93826	NE	VEGA 2412	VEGA INC	NMC93820	384201	CLOSED	05/21/1971	1992
NMC93827	NE	VEGA 2421	VEGA INC	NMC93820	384201	CLOSED	05/21/1971	1992
NMC93828	SW	VEGA 243	VEGA INC	NMC93820	384201	CLOSED	05/21/1971	1992
NMC93829	SE	VEGA 244	VEGA INC	NMC93820	384201	CLOSED	05/21/1971	1992

MER TWP RNG SEC
21 0180S 0600E 030

Serial Num	Quad	Claim Name/Number	Claimant(s)	Lead File	Case Type	Status	Loc Dt	Last Assessment
NMC93836	NW	VEGA 301	VEGA INC	NMC93820	384201	CLOSED	05/21/1971	1992
NMC93837	NE	VEGA 302	VEGA INC	NMC93820	384201	CLOSED	05/21/1971	1992
NMC93838	SW	VEGA 303	VEGA INC	NMC93820	384201	CLOSED	05/21/1971	1992
NMC93839	SE	VEGA 304	VEGA INC	NMC93820	384201	CLOSED	05/21/1971	1992

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BUREAU OF LAND MANAGEMENT
MINING CLAIM GEOGRAPHIC REPORT
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MER TWP RNG SEC
21 0180S 0600E 031

Serial Num	Quad	Claim Name/Number	Claimant(s)	Lead File	Case Type	Status	Loc Dt	Last Assessment
NMC93840	NW	VEGA 311	VEGA INC	NMC93820	384201	CLOSED	05/21/1971	1992
NMC93841	NE	VEGA 312	VEGA INC	NMC93820	384201	CLOSED	05/21/1971	1992
NMC93842	SW	VEGA 313	VEGA INC	NMC93820	384201	CLOSED	05/21/1971	1992
NMC93843	SE	VEGA 314	VEGA INC	NMC93820	384201	CLOSED	05/21/1971	1992

MER TWP RNG SEC
21 0180S 0600E 032

Serial Num	Quad	Claim Name/Number	Claimant(s)	Lead File	Case Type	Status	Loc Dt	Last Assessment
NMC93844	NW	VEGA 321	VEGA INC	NMC93820	384201	CLOSED	05/21/1971	1992
NMC93845	SW	VEGA 323	VEGA INC	NMC93820	384201	CLOSED	05/21/1971	1992
NMC93846	SE	VEGA 324	VEGA INC	NMC93820	384201	CLOSED	05/21/1971	1992

MER TWP RNG SEC
21 0190S 0610E 016

Serial Num	Quad	Claim Name/Number	Claimant(s)	Lead File	Case Type	Status	Loc Dt	Last Assessment
NMC562827	SE	ORO #13	CITY OF N LAS VEGAS	NMC552815	384201	CLOSED	07/14/1989	0000
NMC562828	SE	ORO #14	CITY OF N LAS VEGAS	NMC552815	384201	CLOSED	07/14/1989	0000
NMC562829	SE	ORO #15	CITY OF N LAS VEGAS	NMC552815	384201	CLOSED	07/14/1989	0000
NMC562830	SE	ORO #16	CITY OF N LAS VEGAS	NMC552815	384201	CLOSED	07/14/1989	0000
NMC575136	SW	PLACER # 15	CITY OF N LAS VEGAS	NMC575132	384201	CLOSED	08/10/1989	0000
NMC575137	SE	PLACER # 16	CITY OF N LAS VEGAS	NMC575132	384201	CLOSED	08/10/1989	0000

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Appendix J

SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE

Table J.1. Selected Age and Education Characteristics, 2000

	Nevada	Clark County	Las Vegas	North Las Vegas	Las Vegas Paiute Tribe
Various Statistics					
Median Age	35.0	34.4	34.5	28.8	30.5
Male	1,018,051 (50.9%)	699,728 (50.9%)	243,077 (50.5%)	58,947 (51%)	52 (48.1%)
Female	980,206 (49.1%)	676037 (49.1%)	235,357 (49.2%)	56,541 (49%)	56 (51.9%)
Number of households	751,165	512,253	176,750	34,018	31
Average household size	2.62	2.65	2.66	3.36	3.48
Education Statistics					
School Enrollment					
Elementary school	47.1%	47.9%	49.0%	53.4%	77.8%
High school	21.2%	20.7%	20.8%	19.9%	3.7%
College	20%	19.5%	17.7%	12.6%	0.0%
Education of Population over 25 Years					
Less than high school	19.3%	20.5%	20.6%	33.5%	22.7%
High school graduate	29.3%	29.9%	28.9%	27.8%	59.5%
Some college	27%	26.4%	25.7%	22.9%	14.9%
College or graduate degree*	18.2%	17.4%	18.2%	10.1%	0.0%

Source: Census Bureau (2000b, 2000c).

* Does not include Associate's degrees awarded.

Table J.2. Major Employers in Clark County, Last Quarter 2006

Company	No. Full-Time Employees
Clark County School District	35,212
Clark County	10,107
Bellagio Hotel and Casino	9,812
MGM Grand Hotel, Inc.	9,289
Wynn Las Vegas	9,072
Mandalay Bay Resort and Casino	8,193
Caesars Palace Hotel and Casino	7,748
Mirage Hotel and Casino	5,710
Las Vegas Metropolitan Police	5,018
Rio Hotel and Casino	4,556
UNLV	3,244

Source: CCDCP (2006).

Table J.3. Employment by Industry, 2000 and 2005

Total Employment by Industry	Clark County				Nevada			
	2001	2005	% Change	% of 2005 Total	2001	2005	% Change	% of 2005 Total
Farm Employment	361	339	−6.1%	0.0%	5,501	5,156	−6.3%	0.3%
Non-farm Employment	884,221	1,073,443	21.4%	100.0%	1,262,498	1,522,275	20.6%	99.7%
Private Employment	801,510	975,039	21.7%	90.8%	1,131,913	1,366,333	20.7%	89.5%
Forestry, fishing	333	325	−2.4%	0.0%	1,983	1,762	−11.1%	0.1%
Mining	1,357	1,250	−7.9%	0.1%	12,917	12,817	−0.8%	0.8%
Utilities	2,733	3,413	24.9%	0.3%	4,795	5,324	11.0%	0.3%
Construction	78,289	114,588	46.4%	10.7%	107,302	154,978	44.4%	10.1%
Manufacturing	22,260	27,019	21.4%	2.5%	45,746	51,662	12.9%	3.4%
Wholesale trade	22,862	26,374	15.4%	2.5%	38,165	41,970	10.0%	2.7%
Retail trade	94,077	111,541	18.6%	10.4%	133,350	159,527	19.6%	10.4%
Transportation and warehousing	29,319	33,661	14.8%	3.1%	40,783	48,115	18.0%	3.2%
Information	16,212	13,356	−17.6%	1.2%	21,909	18,760	−14.4%	1.2%
Finance and insurance	45,074	52,792	17.1%	4.9%	62,657	71,946	14.8%	4.7%
Real estate and rental and leasing	41,731	60,886	45.9%	5.7%	58,556	86,177	47.2%	5.6%
Professional and technical services	42,440	54,168	27.6%	5.0%	62,571	80,268	28.3%	5.3%
Management of companies and enterprises	6,545	10,203	55.9%	1.0%	9,680	13,956	44.2%	0.9%
Administrative and waste services	59,800	75,941	27.0%	7.1%	78,841	102,890	30.5%	6.7%
Educational services	3,870	6,240	61.2%	0.6%	4,942	9,070	83.5%	0.6%
Health care and social assistance	20,286	62,636	208.8%	5.8%	72,949	93,763	28.5%	6.1%
Arts, entertainment, and recreation	27,427	30,612	11.6%	2.9%	42,627	47,047	10.4%	3.1%
Accommodation and food services	223,647	250,426	12.0%	23.3%	283,926	307,328	8.2%	20.1%
Other services	33,248	39,608	19.1%	3.7%	48,214	58,937	22.2%	3.9%
Government	82,711	98,404	19.0%	9.2%	130,585	155,942	19.4%	10.2%
Federal, civilian	8,966	11,080	23.6%	1.0%	15,140	17,019	12.4%	1.1%
Military	9,870	11,377	15.3%	1.1%	11,615	13,860	19.3%	0.9%
State government	11,690	14,294	22.3%	1.3%	25,841	31,565	22.2%	2.1%
Local government	52,185	61,653	18.1%	5.7%	77,989	93,498	19.9%	6.1%
Total Employment	**884,582**	**1,073,782**	**21.4%**		**1,267,999**	**1,527,431**	**20.5%**	

Source: BEA (2007).

Table J.4. Income Characteristics, 2000

Location	Per Capita Personal Income ($)	Median Household Income ($)	Median Family Income ($)
Nevada	21,989	44,581	50,849
Clark County	21,785	44,616	50,485
Las Vegas	22,060	44,069	50,465
North Las Vegas	16,023	46,057	46,540
Las Vegas Paiute Tribe	8,529	29,861	28,611

Source: Census Bureau (2000c).

Table J.5. Labor Force Summary, 1990–2004

Location	Labor Force			Employed			Unemployed			Unemployment Rate (%)		
	1990	2000	2006	1990	2000	2006	1990	2000	2006	1990	2000	2006
Nevada	657,878	1,003,293	1,291,287	607,437	933,280	1,224,523	40,083	61,920	66,764	6.1	6.2	5.2
Clark County	405,957	688,917	920,842	370,583	937,073	872,024	26,633	44,734	48,643	6.6	6.5	5.3
Las Vegas	141,467	231,388	283,504	131,001	214,301	265,916	9,297	16,176	16,829	6.6	7.0	5.9
North Las Vegas	22,257	50,594	92,073	19,510	45,740	85,157	2,507	3,980	4,572	11.3	7.9	5.0
Paiute Reservation	40	33	NA	32	32	NA	8	1	NA	20.0	3.0	NA

Source: Census Bureau (1990, 2000c, 2006).

Table J.6. Total Estimated Occupied Housing Units in the CTA Study Area, 1996–2006

	Single Family	Duplex or ¾Plex	Mobile Home	Apartment	Townhome	Condo	Total Housing Unit	AAGR* 1996–2006 (%)	Growth 1996–2006 (%)
Las Vegas									
1996	89,181	7,586	3,295	44,030	5,053	10,430	159,575		
1997	91,219	7,163	3,179	41,575	5,182	10,457	158,775		
1998	98,240	7,790	3,282	48,628	7,406	9,094	174,440		
1999	101,783	7,238	3,143	46,478	7,351	9,247	175,240		
2000	110,497	7,598	3,420	48,927	5,790	16,447	192,679		
2001	114,490	7,540	3,344	48,769	5,767	16,331	196,241		
2002	119,001	7,513	3,333	49,671	5,807	16,722	202,047		
2003	122,754	7,523	3,370	49,950	6,271	17,418	207,286		
2004	127,980	7,386	3,315	50,755	8,021	17,833	215,290		
2005	382,217	17,611	6,735	108,510	15,782	38,368	569,223		
2006	138,172	7,376	3,160	51,284	9,721	18,149	227,862	3.29	42.79
North Las Vegas									
1996	19,764	3,664	993	1,586	428	368	26,803		
1997	20,901	3,502	958	1,874	397	352	27,984		

Table J.6. Total Estimated Occupied Housing Units in the CTA Study Area, 1996–2006 (Continued)

	Single Family	Duplex or ¾Plex	Mobile Home	Apartment	Townhome	Condo	Total Housing Unit	AAGR* 1996–2006 (%)	Growth 1996–2006 (%)
1998	23,392	3,663	994	3,132	535	324	32,040		
1999	25,203	3,476	817	3,076	497	683	33,752		
2000	28,357	3,764	1,166	4,389	484	1,092	39,252		
2001	29,379	3,695	838	4,967	555	796	40,230		
2002	31,555	3,695	838	5,234	627	846	42,795		
2003	35,138	3,695	838	5,677	725	886	46,959		
2004	40,851	3,695	838	5,949	1,025	1,364	53,722		
2005	140,910	13,948	2,297	16,886	3,044	3,449	180,534		
2006	51,300	3,695	893	5,446	1,494	1,861	64,689	8.33	141.34
Clark County									
1996	225,203	19,367	29,313	115,866	16,489	37,153	443,391		
1997	232,536	18,288	28,522	118,251	16,280	32,988	446,865		
1998	256,249	19,404	29,782	140,652	21,830	28,144	496,061		
1999	268,149	18,118	27,932	138,566	21,956	27,367	502,088		
2000	296,570	19,791	30,610	150,878	21,697	39,836	559,382		
2001	314,001	19,328	30,233	154,002	24,006	39,649	581,219		
2002	333,111	19,385	31,350	161,289	24,792	41,234	611,161		
2003	356,188	19,197	28,870	164,645	25,779	43,673	638,352		
2004	381,275	19,168	29,305	168,076	28,684	49,050	675,558		
2005	1,157,447	52,915	61,668	345,078	58,781	112,816	788,705		
2006	433,317	19,101	30,460	159,803	35,158	62,978	740,817	4.78	67.07

Source: CCDCP (2006).

* Average annual growth rate.

Table J.7. Average Median Gross Rents and Housing Costs in the CTA Study Area in 2000*

	Average Median Gross Rent ($)	Average Median Housing Value* ($)
Las Vegas	699	137,300
North Las Vegas	644	123,000
Las Vegas Paiute Tribe	525	48,000
Clark County	632	139,500
State of Nevada	699	142,000
United States	602	119,600

Source: Census Bureau (2000c).

* Inflation adjusted for 2000$; specified owner-occupied housing units.

Table J.8. Real Estate Sales for Las Vegas Metro Area, 1999–2006

	1999	2000	2001	2002	2003	2004	2005	2006	AAGR (%)	Growth 1999–2005 (%)
Closed home sales	21,162	20,520	22,940	22,502	25,230	29,248	30,750	36,051	6.89	70.35
Median new home price	147,750	161,893	178,920	186,827	209,611	290,287	309,990	330,094	10.57	123.41

Source: Southern Nevada Home Builders Association (2007).

Table J.9. Reported Crimes for LVMPD and NLVPD, 1995 and 2005

Crimes	Nevada*		LVMPD†		NLVPD	
	1995	2005	1995	2005	1995	2005
Murder	155	194	118	145	11	20
Rape	880	923	571	616	66	56
Robbery	4,89	4,617	3,712	3,494	464	408
Aggravated assault	7,670	8,098	5,122	5,275	1,077	872
Burglary	18,362	21,821	12,219	14,368	1,300	1,866
Larceny—theft	49,903	47,234	30,445	27,695	2,727	3,249
Motor vehicle thefts	11,043	2,636	7,991	19,950	920	2,466
Total	**92,902**	**109,250**	**60,178**	**71,543**	**6,565**	**8,937**

Source: BJS (2007).

* Counts based on sum of all reporting agencies in Nevada.

† LVMPD serves the City of Las Vegas and unincorporated Clark County.

Table J.10. Crime Rates for LVMPD, NLVPD, and Nevada, 1995 and 2005

Location	Crimes Committed		
	1995	2005	% Change in Crime Rate
Nevada	6,579	4,848	−26.31
LVMPD	7,584	5,581	−26.41
NLVPD	9,687	5,443	−43.81

Source: BJS (2007).

Table J.11. Public Services Available within the CTA Study Area

Subarea	Schools*	Library†	Solid Waste‡ (System Type)	Police§	Fire§	Hospitals¶
Las Vegas	Joint with Clark County	24	Both	8	16	23
North Las Vegas	Joint with Clark County	2	Both	2	6	1
Las Vegas Paiute Tribe	None	None	Municipal (City of Las Vegas)	1	Joint with Las Vegas	0
Clark County	326	Joint with Las Vegas	Both	Joint with Las Vegas	25	25
State of Nevada	538	108	Both	–	–	30

* Elementary and secondary public schools, 2006–2007 school year (Applied Analysis 2007).

† Public libraries only as of FY 2006–2007 (Nevada State Library and Archives 2007).

‡ Solid waste systems include private or municipal; "both" means both methods were used (Applied Analysis 2007).

§ Number of stations (not employees) (Applied Analysis 2007).

¶ Source: American Hospital Directory (2007).

Table J.12. Average Gross Mean and Median Real Estate Tax, CTA Study Area, 2000*

	Average Median Real Estate Tax ($)	Average Mean Real Estate Tax ($)
Las Vegas	1,200	1,400
North Las Vegas	1,165	1,210
Paiute	–	–
Clark County	1,174	1,342
State of Nevada	1,187	1,371

Source: Census Bureau (2000c).

* Inflation adjusted for 2000$; specified owner-occupied housing units.

Table J.13. PILT, Clark County and Nevada, 1999–2006

Year	Clark County	Nevada
1999	$991,677	7,180,805
2000	$1,048,261	7,604,840
2001	$1,505,243	10,956,327
2002	$1,579,548	11,506,400
2003	$1,811,804	13,132,942
2004	$1,862,174	13,495,376
2005	$1,900,732	13,732,723
2006	$1,938,337	14,135,972
% Growth 1999–2006	**95.46**	**96.86**

Source: U.S. Department of the Interior (2007).

Table J.14. Clark County Sales and Use Tax Revenue, 2000–2006

2000	2001	2002	2003	2004	2005	2006
$1,940,227,309	$2,004,152,187	$2,026,522,333	$2,214,389,999	$2,604,929,990	$2,984,462,586	$3,243,187,831
% Change Year to Year	3.29	1.12	9.27	17.64	14.57	8.67
% Change Trend 2000–2006						67.15

Source: NSD (2006).

Table J.15. Nevada Sales and Use Tax Revenue, 2000–2006

2000	2001	2002	2003	2004	2005	2006
$2,750,071,695	$2,832,345,655	$2,823,533,894	$3,087,848,866	$3,579,833,092	$4,150,906,098	$4,486,362,249
% Change Year to Year	2.99	−0.31	9.36	15.93	15.95	8.08
% Change Trend 2000–2006						63.13

Source: NSD (2006).

Table J.16. Clark County Sales Tax Breakdown, 2006

Minimum Tax Rate %	
Sales tax	**2.00**
Local school support tax	2.25
Basic city-county relief tax	0.50
Supplemental city-county relief tax	1.75
Option tax	
Police protection	0.25
Public mass transportation and road construction	0.50
Flood control	0.25
Infrastructure	0.25
Total	**7.75**

Source: NSD (2006).

Table J.17. Nevada Lodging Tax Revenue, Fiscal Years 2000–2006

2000–2001	2001–2002	2002–2003	2003–2004	2004–2005	2005–2006
$13,050,670	$11,268,582	$11,875,153	$13,305,505	$15,134,104	$17,279,556
% Change Year to Year	−13.66	5.38	12.04	13.74	14.18
% Change Trend 2000–2006					32.40

Source: Nevada Department of Taxation (2007).

Table J.18. Gaming Revenue, 1999–2005

	1999 ($)	2000 ($)	2001 ($)	2002 ($)	2003 ($)	2004 ($)	2005 ($)
Downtown Las Vegas	667,172,173	670,245,345	671,942,657	661,435,043	655,186,940	653,438,887	658,620,516
% Change Year to Year	−2.34	0.46	0.25	−1.56	−0.94	−0.27	0.79
% Change Trend 1999–2005	−1.28						
Las Vegas Strip	4,128,143,954	4,683,729,471	4,615,644,944	4,247,749,172	4,490,623,007	4,909,991,047	5,283,122,106
% Change Year to Year	11.04	13.46	−1.45	−7.97	5.72	9.34	7.60
% Change Trend 1999–2005	27.98						
Clark County	6,783,980,118	7,272,083,749	7,355,623,122	7,377,726,505	7,638,930,066	8,456,485,865	9,242,973,632
% Change Year to Year	11.44	7.19	1.15	0.30	3.54	10.70	9.30
%t Change Trend 1999–2005	36.25						
Nevada	8,426,224,115	9,305,916,419	9,310,594,712	8,911,540,280	9,250,496,837	9,83,510,737	10,662,454,467
% Change Year to Year	8.81	10.48	0.02	−4.29	3.80	6.84	7.88
% Change Trend 1999–2005	26.54						

Source: University of North Las Vegas, Center for Gaming Research (2007).

Table J.19. Total New Building Permits, 1996–2005

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	% Growth 1996–2005
Las Vegas*	16,611	16,110	15,809	16,612	14,913	14,477	14,916	18,193	19,147	15,267	−8.09
North Las Vegas†	4,233	4,122	4,391	4,175	4,626	5,961	6,489	9,759	10,185	11,392	169.12
Clark County‡	–	–	–	–	–	–	46,627	53,499	61,742	57,935	24.25§

* Source: City of Las Vegas (2006a).
† Source: City of North Las Vegas (2007c).
‡ Source: Applied Analysis (2007).
§ Percent growth for Clark County is only available from 2002 to 2005.

Table J.20. Total Dollar Value for New Building Permits (New, Privately Owned Residential), 1995–2005

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	% Growth 1996–2005
Las Vegas	726,573,159	692,606,873	601,007,492	599,645,960	513,443,785	544,980,266	703,152,829	1,060,388,643	1,023,998,094	930,990,766	–1.83
North Las Vegas	209,888,549	160,759,511	238,615,441	181,547,891	259,128,988	298,578,724	335,750,266	567,399,334	795,082,404	1,056,490,699	165.52
Clark County	2,265,682,398	2,248,410,974	2,186,603,261	2,351,029,824	2,666,696,445	2,999,763,863	3,209,523,879	3,888,553,535	4,193,823,122	5,203,972,340	100.09

Source: Census Bureau (2000b, 2000c).

Appendix K

UTAH STATE UNIVERSITY UPPER LAS VEGAS WASH CONSERVATION TRANSFER AREA: A SYSTEM TO DEVELOP ALTERNATIVE SCENARIOS

UPPER LAS VEGAS WASH CONSERVATION TRANSFER AREA:

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A SYSTEM TO DEVELOP ALTERNATIVE SCENARIOS

PREPARED FOR THE LAS VEGAS
BUREAU OF LAND MANAGEMENT

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UtahState
UNIVERSITY

UTAH STATE UNIVERSITY TEAM

Janis L. Boettinger
Assistant Department Head and
Associate Professor of Plants, Soils,
and Biometeorology

Glen Busch
Project Manager

Amy Croft
Ph.D. Candidate, Biology

Thomas C. Edwards, Jr.
Professor of Wildland Resources;
Research Ecologist, USGS

Brian Jennings
Ph.D. Candidate, Sociology

Richard S. Krannich
Department Head and Professor of
Sociology, Social Work, and Anthropology

Ellie Leydsman
M.S. Candidate, Bioregional Planning

James A. MacMahon
Trustee Professor of Biology;
Director of the Ecology Center

Richard E. Toth
Professor of Environment and Society

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PREFACE

The Las Vegas Valley is located in southern Clark County, Nevada within the Mojave Desert Ecoregion of the Basin and Range Province. The Mojave Desert is an expansive region in the arid western United States spanning southeastern California and southern Nevada (Figure 1). The low elevations of the Mojave Desert create warm year-round temperatures with the number of frost-free days greater than 200. Rainfall in the Mojave Desert is scarce and averages less than six inches (15.24 cm) per year. The average precipitation in Las Vegas, Nevada is 4.13 inches (10.49 cm). The limited precipitation in the Mojave Desert promotes unique vegetation communities characterized by low, widely spaced shrubs with numerous species of cacti, yucca, and flowering annuals. The creosote bush-dominated communities of southern Nevada provide habitat for several species of reptiles, birds, and mammals (MacMahon, 1985; Rundel and Gibson, 1996).

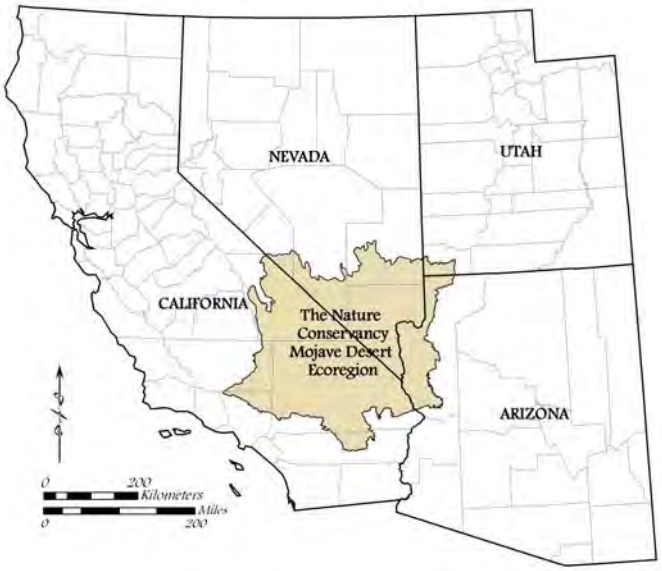


Figure 1. The Nature Conservancy Mojave Desert Ecoregion.

The Las Vegas Valley is one of the fastest growing regions in the United States and is continuing to grow at unprecedented rates with the remaining parcels of private land being converted to urban land uses to accommodate the growing population. The combined population of the North Las Vegas and Las Vegas municipalities more than doubled from 306,003 in 1990 to 721,822 in 2005. The population of Clark County increased from 741,459 in 1990 to 1,710,551 in 2005 (Figure 2) (United States Census Bureau).

As a result of rapid urbanization and previous legislation mandating the disposal of Federal lands in the Las Vegas Valley, BLM managed lands have become widely separated and surrounded by more urbanized land uses. To address issues associated with the need for developable lands and the management of public lands, Congress passed the Southern Nevada Public Land Management Act (SNPLMA) in 1998 (Public Law 105-263). The SNPLMA authorized the Bureau of Land Management to dispose of federal lands in

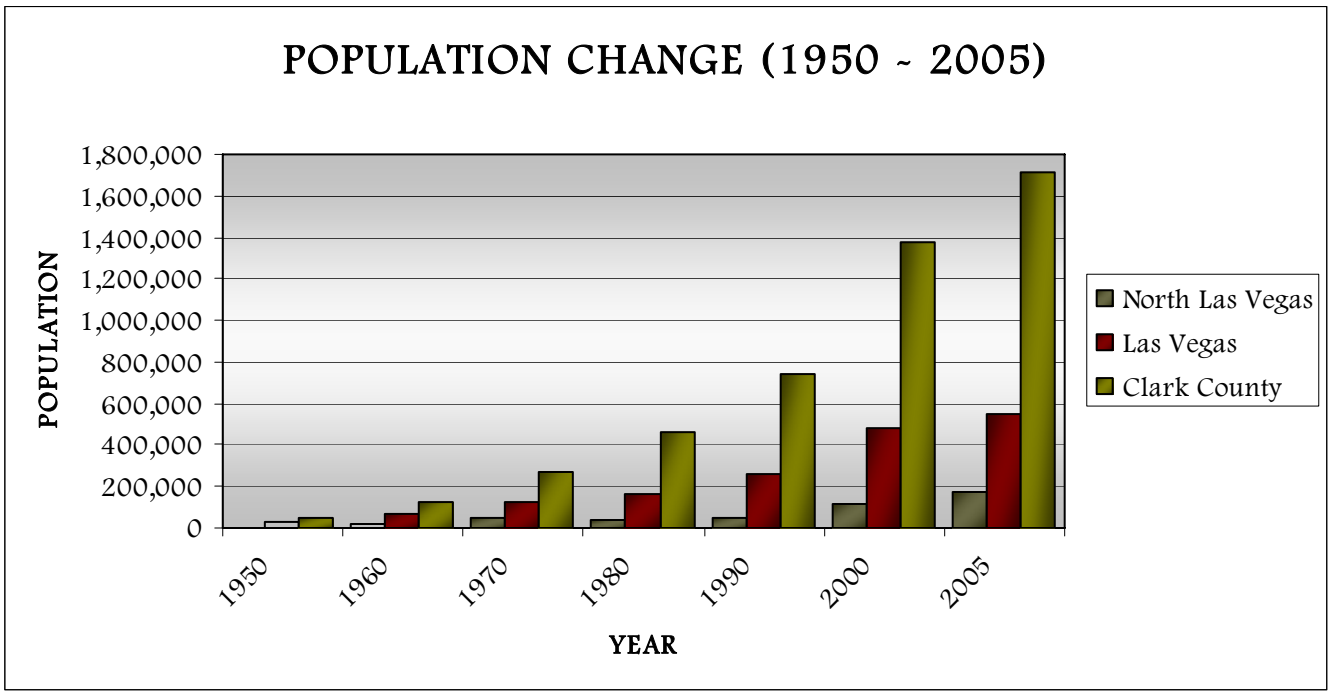


Figure 2. Population Change in North Las Vegas City, Las Vegas City, and Clark County, Nevada (U.S. Census Bureau).

Clark County, Nevada consistent with population growth and community land-use plans and policies. In 2002, the Clark County Conservation of Public Land and Natural Resources Act (Public Law 107-282) amended the SNPLMA to expand the disposal boundary area to address the continuing increase in growth in the Las Vegas region.

The disposal boundary established by the Southern Nevada Public Land Management Act of 1998 as amended by the Clark County Conservation of Public Land and Natural Resources Act of 2002 encompasses the Las Vegas Valley in southern Clark County, Nevada. The public lands that became available for auction were predominantly located in the northern and southern portions of the disposal area. This project and preliminary alternative future analyses focus on the lands available for disposal in the north (Figure 3). The northern area encompasses the Upper Las Vegas Wash and is bordered by Nellis Air Force Base to the east, the Desert National Wildlife Refuge to the north, and Red Rock Canyon National Conservation Area and the Las Vegas Paiute Indian Reservation to the west (Figure 4).

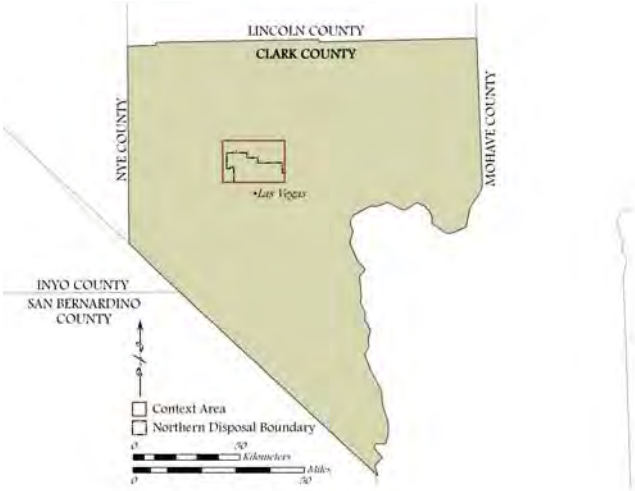


Figure 3. Disposal Boundary, Clark County, Nevada.

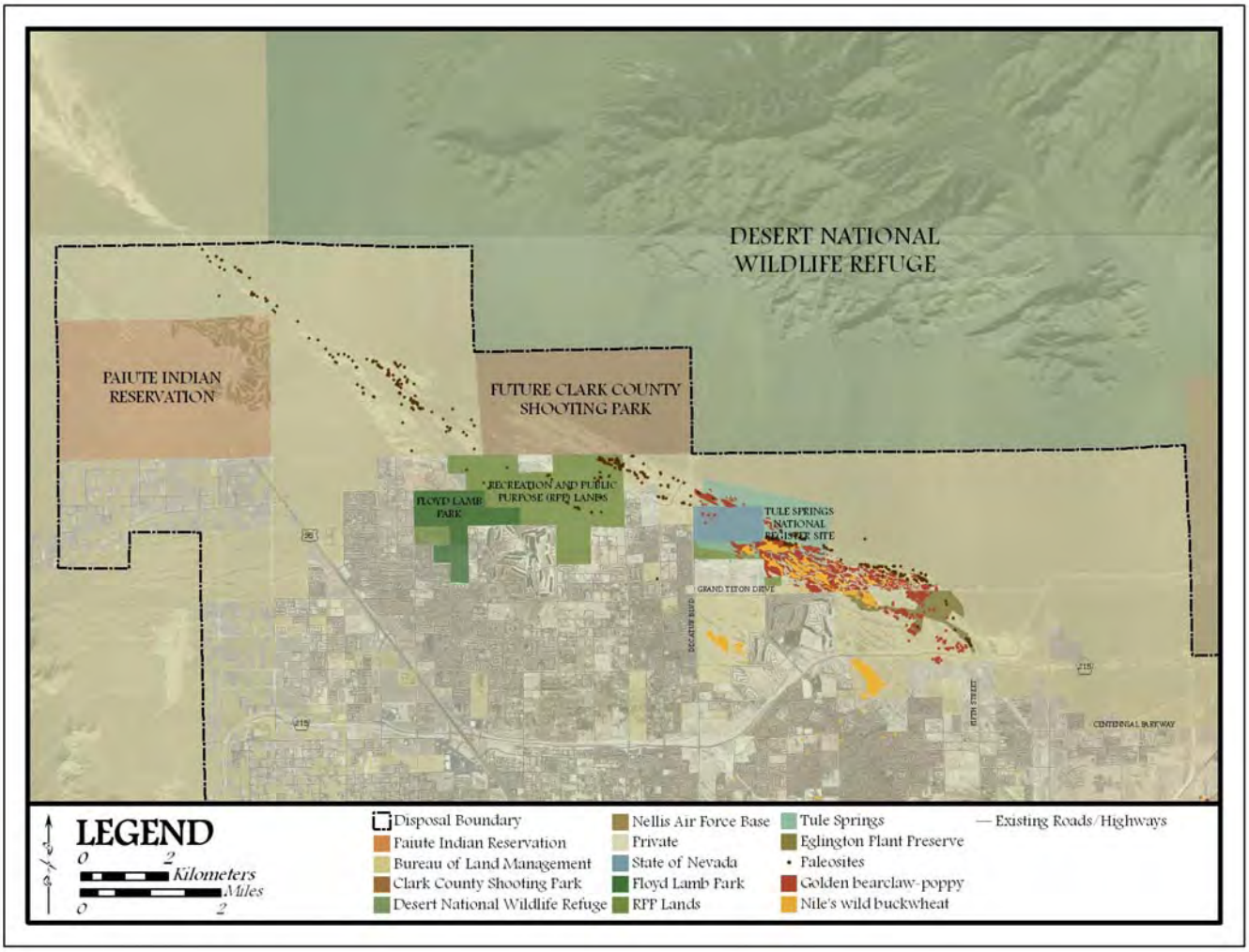


Figure 4. Upper Las Vegas Wash Conservation Transfer Area.

While the Bureau of Land Management has been authorized to dispose of lands within Clark County consistent with population growth and community land-use plans, they are bound by other Federal legislation which has prevented the immediate auction of lands within the Upper Las Vegas Wash.

The Endangered Species Act of 1973 (16 USC 1531-1543) provides for the conservation of critical habitat and ecosystems upon which threatened and endangered species depend on for survival and continued existence. The Bureau of Land Management is also required to protect candidate, proposed, and sensitive plant species. Within the Upper Las Vegas Wash, there are two rare plant species, the Golden bearclaw-poppy (*Arctomecon californica* Torrey and Frémont) and Nile's wild buckwheat (*Eriogonum corymbosum* Bentham var. *nilesii* Reveal), both of which are listed as sensitive species by the BLM. The Golden bearclaw-poppy is classified as critically endangered by the State of Nevada and Nile's wild buckwheat is a candidate for listing on the State of Nevada's critically endangered plant species list. Declines in the population of these two species is largely attributed to the conversion of habitat for urban land uses, off-road vehicle use, flood control infrastructure, road and utility corridors, trash dumping, and gypsum mining (Morefield, 2001).

There are several animal wildlife species which are listed as sensitive by the BLM, some of which are protected by the State of Nevada. Of critical concern is the threatened desert tortoise (*Gopherus agassizii*). The desert tortoise inhabits a range of desert environments in the southwestern United States, including southeastern California and southern Nevada. Although the BLM (*Las Vegas Valley Disposal Boundary EIS*) indicates that there is no designated critical habitat within the disposal boundary, the habitat of the desert tortoise encompasses Mojave Desert creosote bush scrub, thorn scrub, and cacti, specifically in sandy or gravelly locations. Washes, canyon bottoms, and oases also serve as habitat for the desert tortoise (MacMahon, 1985).

Cultural resources within the disposal boundary are protected by the American Antiquities Act of 1906, the National Historic Preservation Act of 1966, and the Archaeological Resources Protection Act of 1979. Review of the *Las Vegas Disposal Boundary EIS* (Affected Environment) indicates that during a Class III field inventory, archeologists identified 100 sites, both prehistoric and historic, within the disposal area, 69 of which were not previously recorded.

The American Antiquities Act of 1906 (16 USC 431-433) seeks to protect historic and prehistoric ruins, monuments, objects of antiquity and scientific interest on lands owned or controlled by the Government of the United States by imposing misdemeanor-level criminal penalties. The National Historic Preservation Act of 1966 (16 USC 470) created the National Register of Historic Places which extends protection to historic places of State, local, and national significance. This legislation protects Tule Springs National Register Site, an archeological site which has produced substantial data relevant to the environmental history of the Great Basin. The Archaeological Resources Protection Act of 1979 (16 USC 470a-11) provides for the protection of archaeological resources on federal lands by invoking felony-level penalties for excavating, removing, damaging, or defacing any archeological resources older than 100 years on public or Indian lands.

Paleontological resources are fossilized evidence of past life on Earth. Review of the *Las Vegas Disposal Boundary EIS* (Affected Environment) indicates that 438 previously unrecorded paleontological resources were identified within the disposal boundary, the majority of which reside in fossiliferous Quaternary spring deposits in the Upper Las Vegas Wash. Although there is not a great deal of specific legislation protecting fossils other than what has been previously discussed, the Fossil Preservation Act of 1996 (HR 2943) provides for the protection, including the collection and preservation, of fossils that are on Federal lands for the present and future benefit of the people of the United States. This legislation is controversial because it encourages preservation through collection in order to reduce the loss of fossils resulting from erosion and theft.

The Las Vegas Paiute Tribe Reservation is located within the disposal area; therefore, other legislation that is relevant is the American Indian Religious Freedom Act of 1978 and the Native American Graves Protection and Repatriation Act. The American Indian Religious Freedom Act of 1978 (42 USC 1996) protects and preserves the inherent right of Native

Americans to believe, express, and exercise their traditional religions, including access to religious sites. The Native American Graves Protection and Repatriation Act of 1990 (25 USC 3001) establishes the right of Indian tribes to claim ownership of certain cultural items, including human remains and funerary, sacred, and cultural patrimony objects and artifacts.

INTRODUCTION

The primary objective of this deliverable was to develop a range of reasonable alternative scenarios using the best professional judgment of our team prior to the completion of the field work and the acquisition of the social and demographic survey results. There are challenges with generating solid conclusions without the evaluation of field data and social survey results; therefore, the team developed a modular approach for developing alternative scenarios. The components within each module were delineated based on the available data and some preliminary field work, and they were constructed in such a way that they can be modified based on the analyses of field, social, and demographic data.

The modules encompass five categories of change in which alternatives can be efficiently constructed based on the selection of components within the categories. The categories of change focus on variations of the Las Vegas Paiute Indian Reservation buffer, the northwest portion of the Upper Las Vegas Wash, the Recreation and Public Purpose lands adjacent to Floyd Lamb Park, the southeast portion of the Upper Las Vegas Wash, and the proposed Mountain Edge Beltway. Each category presents a series of components that represent the various objectives of stakeholders, ranging from maximum development to maximum conservation.

Each component within each category is accompanied with a series of assessment metrics. The assessment metrics will assist in evaluating the impacts of the various alternative scenarios. The primary assessment metrics which the team has been asked to evaluate are (1) populations of rare plant species, (2) paleontological resources, and (3) a landscape representative of the Mojave Desert. However, there are several other assessment metrics included which will aid in making an informed and reasoned decision regarding lands available for disposal in the Upper Las Vegas Wash.

Although this modular process presents hundreds of possible combinations, it provides a systematic framework that allows the components of alternative scenarios to be evaluated independently or collectively utilizing the provided assessment metrics.

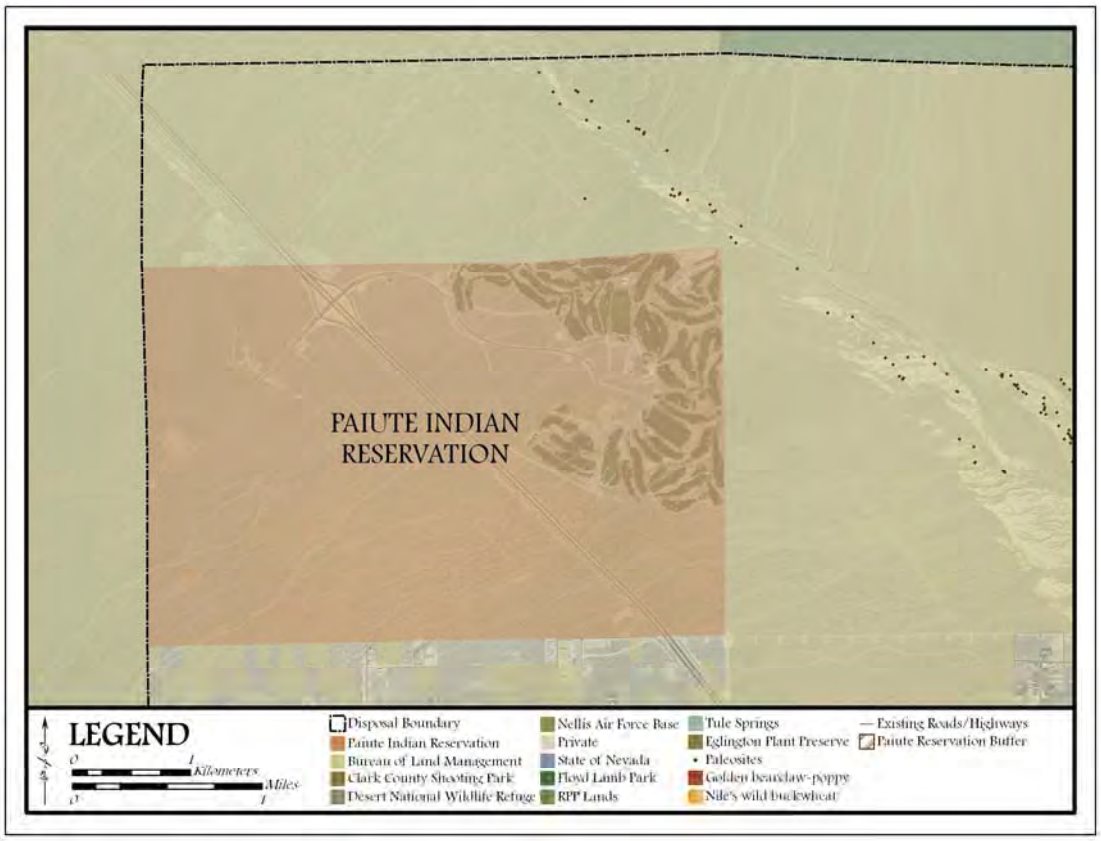
A DVD containing an ArcGIS map document and the GIS shapefiles of the components is provided so alternatives can be composed by the Bureau of Land Management and stakeholders within the Las Vegas Valley.

The GIS data used to create the base layers on the maps was provided by the Las Vegas Bureau of Land Management. Aero-Graphics provided the 2-foot resolution 2005 aerial photography.

ALTERNATIVE COMPONENTS

COMPONENT A PAIUTE INDIAN RESERVATION	COMPONENT B NORTHWEST UPPER LAS VEGAS WASH	COMPONENT C RECREATION & PUBLIC PURPOSE LANDS	COMPONENT D SOUTHEAST UPPER LAS VEGAS WASH	COMPONENT E MOUNTAIN EDGE BELTWAY
~A1~ NO BUFFER	~B1~ ACTIVE WASH	~C1~ NO RPP LANDS	~D1~ RARE PLANT SPECIES	~E1~ NO MOUNTAIN EDGE BELTWAY
~A2~ ONE~EIGHTH MILE BUFFER	~B2~ PALEO RESOURCES	~C2~ RPP LANDS WITH NO DESIGNATED USE	~D2~ PALEO RESOURCES & RARE PLANTS	~E2~ PROPOSED ALIGNMENT
~A3~ ONE~QUARTER MILE BUFFER	~B3~ WASH ECOSYSTEM	~C3~ RPP LANDS AND PRIVATE PARCEL	~D3~ WASH ECOSYSTEM I	~E3~ ALTERNATE ALIGNMENT
~A4~ ONE~HALF MILE BUFFER	~B4~ MOJAVE DESERT ECOSYSTEM		~D4~ WASH ECOSYSTEM II	
~A5~ ONE MILE BUFFER			~D5~ MOJAVE DESERT ECOSYSTEM I	
			~D6~ MOJAVE DESERT ECOSYSTEM II	

PAIUTE INDIAN RESERVATION (A1)



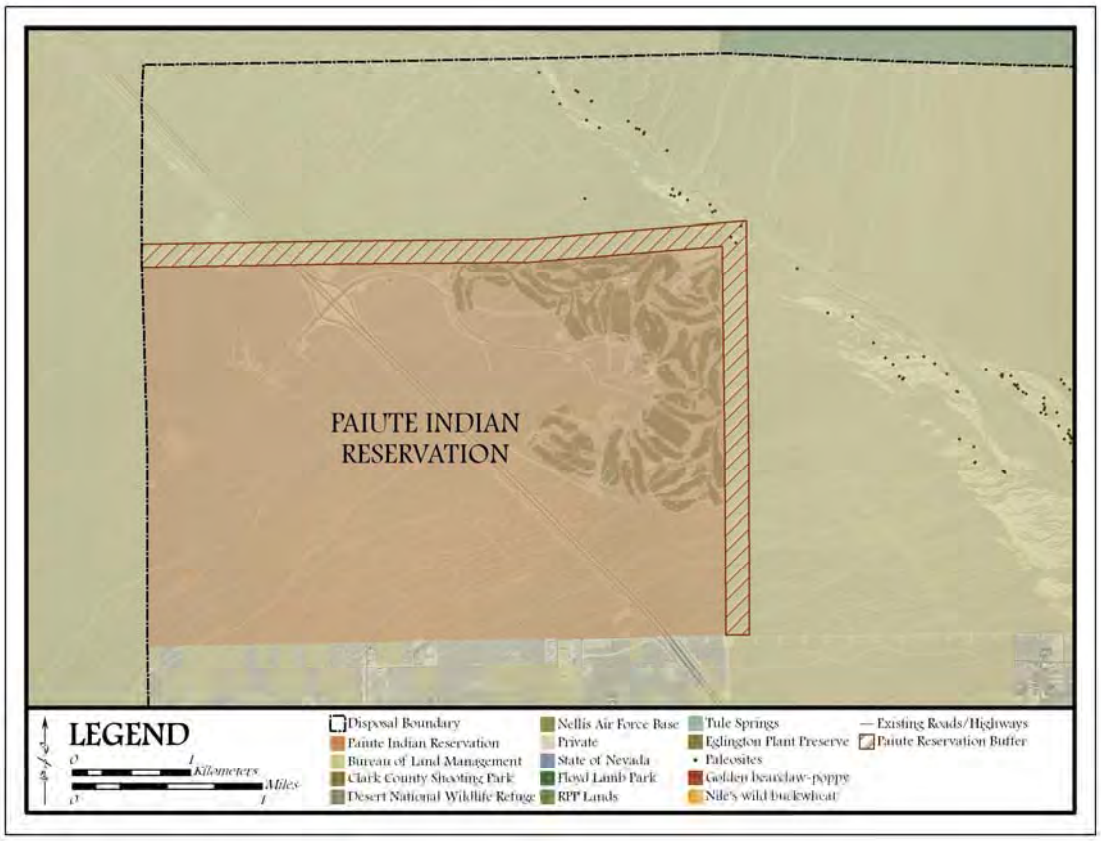
NO BUFFER (A1)

This alternative component represents the exclusion of a buffer on the north and east sides of the Paiute Indian Reservation. The absence of a buffer would not fulfill the request of the Paiute Tribe of Las Vegas, Nevada, but it would provide the greatest amount of urban development adjacent to the reservation in the northwest corner of the disposal area. The exclusion of a buffer would not provide protection from visual and social nuisances associated with the construction and existence of adjacent residential subdivisions and the associated transportation networks, and it would offer no protection of any potential Native American artifacts or burial sites within the North Las Vegas Wash. If Native American cultural sites are discovered, the Native American Graves Protection and Repatriation Act of 1990 mandates that they be protected or returned to lineal descendents or culturally affiliated Indian tribes (http://www.cr.nps.gov/nagpra/). Additionally, the exclusion of a buffer may impact the economic benefits of the Las Vegas Paiute Golf Resort, as the primary attraction and selling point of the resort is that it resides in the "undisturbed beauty of the Southern Nevada desert at the base of the picturesque Spring Mountains" (http://www.lvpaiutegolf.com/).

ASSESSMENT METRICS

- Cultural resources (Native American artifacts and burial sites)
- Visual quality (distance to residential development; vistas of wash and wildlife refuge)
- Road traffic noise (distance to roadway; speed of roadway; average vehicles per hour)
- Air quality (dust from construction sites, roads, and recreation)
- Social impacts (littering; vandalism; unregulated motorized vehicle use)

PAIUTE INDIAN RESERVATION (A2)



ONE-EIGHTH MILE BUFFER (A2)

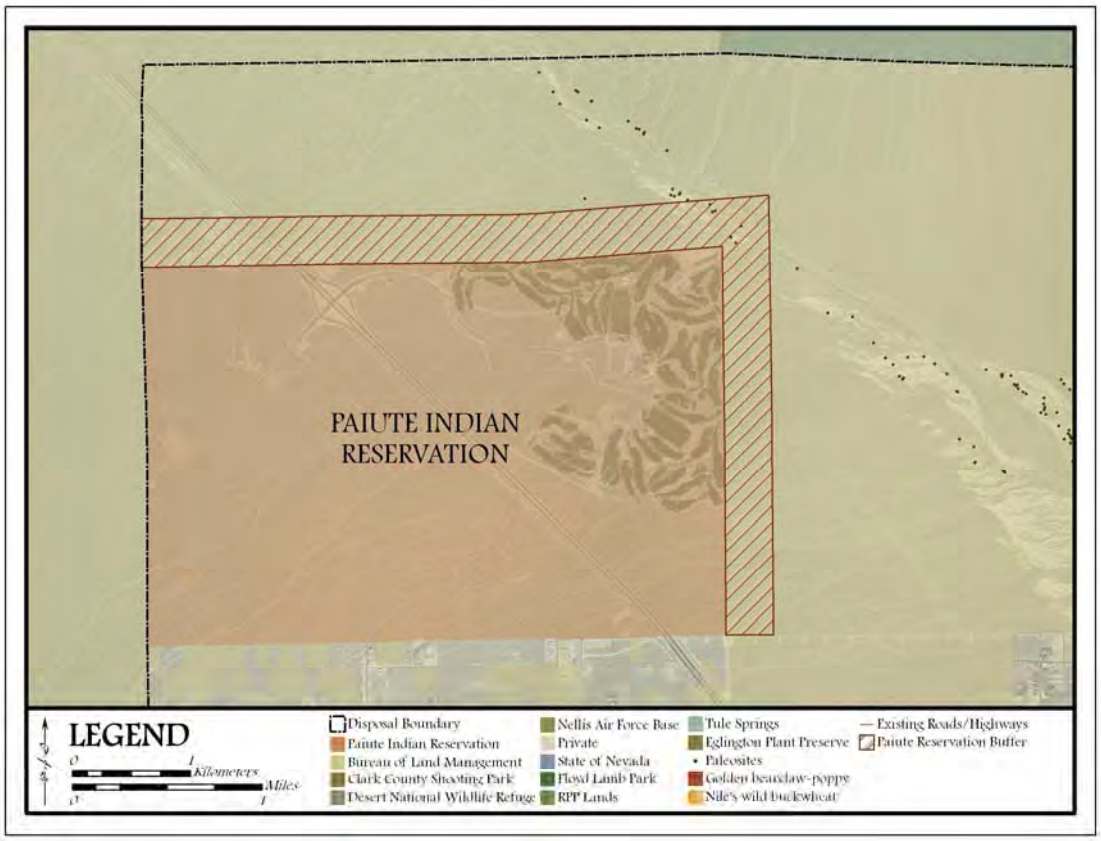
This alternative component represents a one-eighth mile (0.2 km) buffer on the north and east sides of the Paiute Indian Reservation. The existence of a one-eighth mile buffer may not fulfill the request of the Paiute Tribe of Las Vegas, Nevada, but it would provide the greatest amount of urban development adjacent to the reservation in the northwest portion of the disposal area while offering minimal protection from visual and social nuisances associated with the construction and existence of adjacent residential subdivisions and associated transportation networks. The buffer provides a moderately low amount of protection for any potential Native American artifacts or burial sites within the North Las Vegas Wash. However, a one-eighth mile buffer may not be adequate to prevent adverse social impacts within the buffer and sustain the economic benefits of the Las Vegas Paiute Golf Resort.

AREA: 415 acres (168 hectares)

ASSESSMENT METRICS

- Cultural resources (Native American artifacts and burial sites)
- Visual quality (distance to residential development; vistas of wash and wildlife refuge)
- Road traffic noise (distance to roadway; speed of roadway; average vehicles per hour)
- Air quality (dust from construction sites, roads, and recreation)
- Social impacts (littering; vandalism; unregulated motorized vehicle use)

PAIUTE INDIAN RESERVATION (A3)



ONE-QUARTER MILE BUFFER (A3)

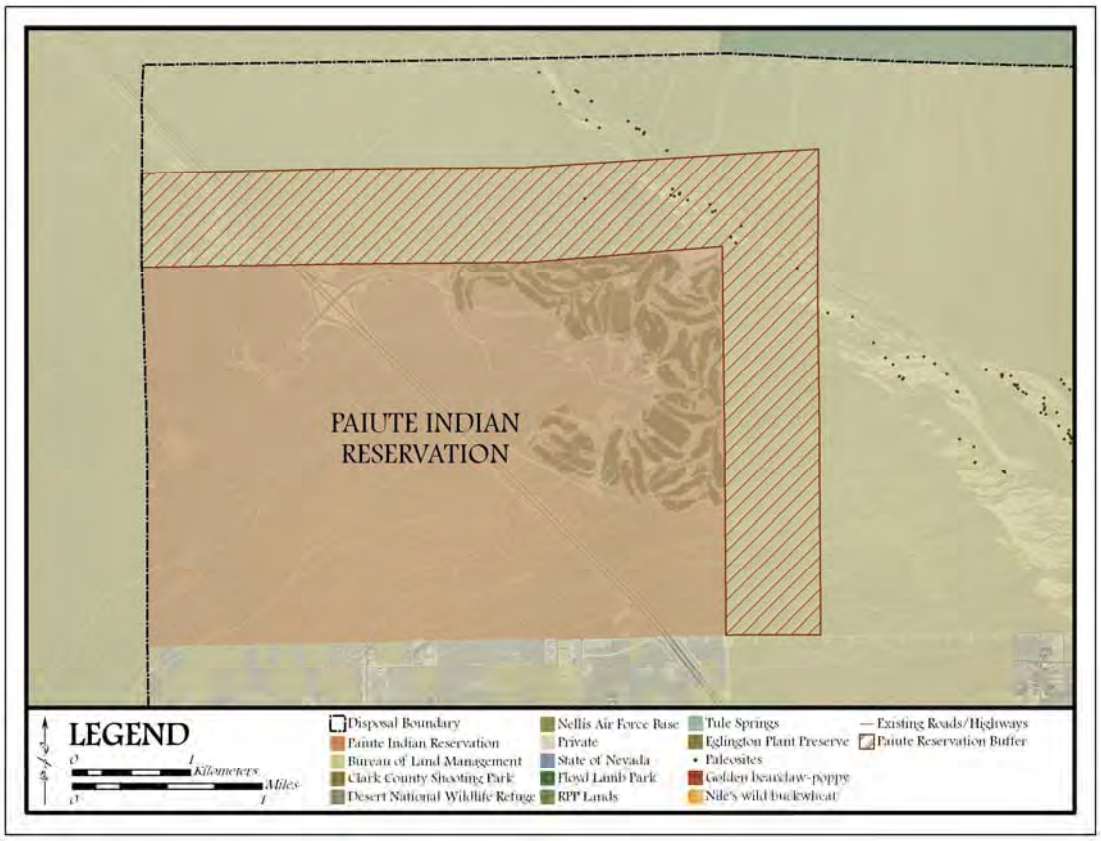
This alternative component represents a one-quarter mile (0.4 km) buffer on the north and east sides of the Paiute Indian Reservation. The existence of a one-quarter mile buffer may not fulfill the request of the Paiute Tribe of Las Vegas, Nevada, but it would provide for a moderate amount of urban development adjacent to the reservation in the northwest portion of the disposal area while providing the Paiute Tribe of Las Vegas, Nevada with a reasonable amount of protection from visual and social nuisances associated with the construction and existence of adjacent residential subdivisions and associated transportation networks. A one-quarter mile buffer may provide a moderate amount of protection for any potential Native American artifacts or burial sites within the North Las Vegas Wash and should be adequate to prevent any adverse social impacts and to maintain the economic benefits of the Las Vegas Paiute Golf Resort.

AREA: 860 acres (348 hectares)

ASSESSMENT METRICS

- Cultural resources (Native American artifacts and burial sites)
- Visual quality (distance to residential development; vistas of wash and wildlife refuge)
- Road traffic noise (distance to roadway; speed of roadway; average vehicles per hour)
- Air quality (dust from construction sites, roads, and recreation)
- Social impacts (littering; vandalism; unregulated motorized vehicle use)

PAIUTE INDIAN RESERVATION (A4)



ONE-HALF MILE BUFFER (A4)

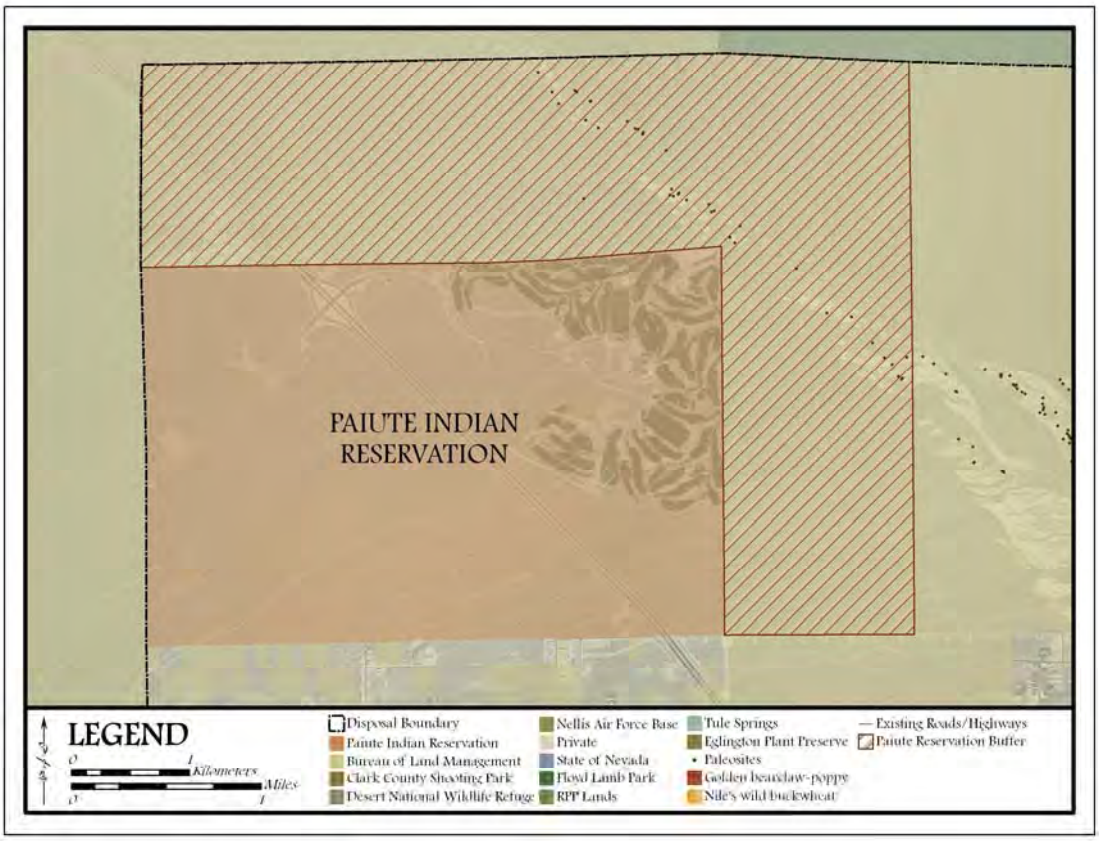
This alternative component represents a one-half mile (0.8 km) buffer on the north and east sides of the Paiute Indian Reservation. The existence of a one-half mile buffer may fulfill the request of the Paiute Tribe of Las Vegas, Nevada; however, it would provide a minimal to moderate amount of urban development adjacent to the reservation in the northwest portion of the disposal area. The existence of a one-half mile buffer should provide protection from visual and social nuisances associated with the construction and existence of adjacent residential subdivisions and associated transportation networks. The width of the buffer provides a moderately high amount of protection for any potential Native American artifacts or burial sites within the North Las Vegas Wash and may be more than adequate to prevent any adverse social impacts and to maintain the economic benefits of the Las Vegas Paiute Golf Resort.

AREA: 1,790 acres (724 hectares)

ASSESSMENT METRICS

- Cultural resources (Native American artifacts and burial sites)
- Visual quality (distance to residential development; vistas of wash and wildlife refuge)
- Road traffic noise (distance to roadway; speed of roadway; average vehicles per hour)
- Air quality (dust from construction sites, roads, and recreation)
- Social impacts (littering; vandalism; unregulated motorized vehicle use)

PAIUTE INDIAN RESERVATION (A5)



ONE MILE BUFFER (A5)

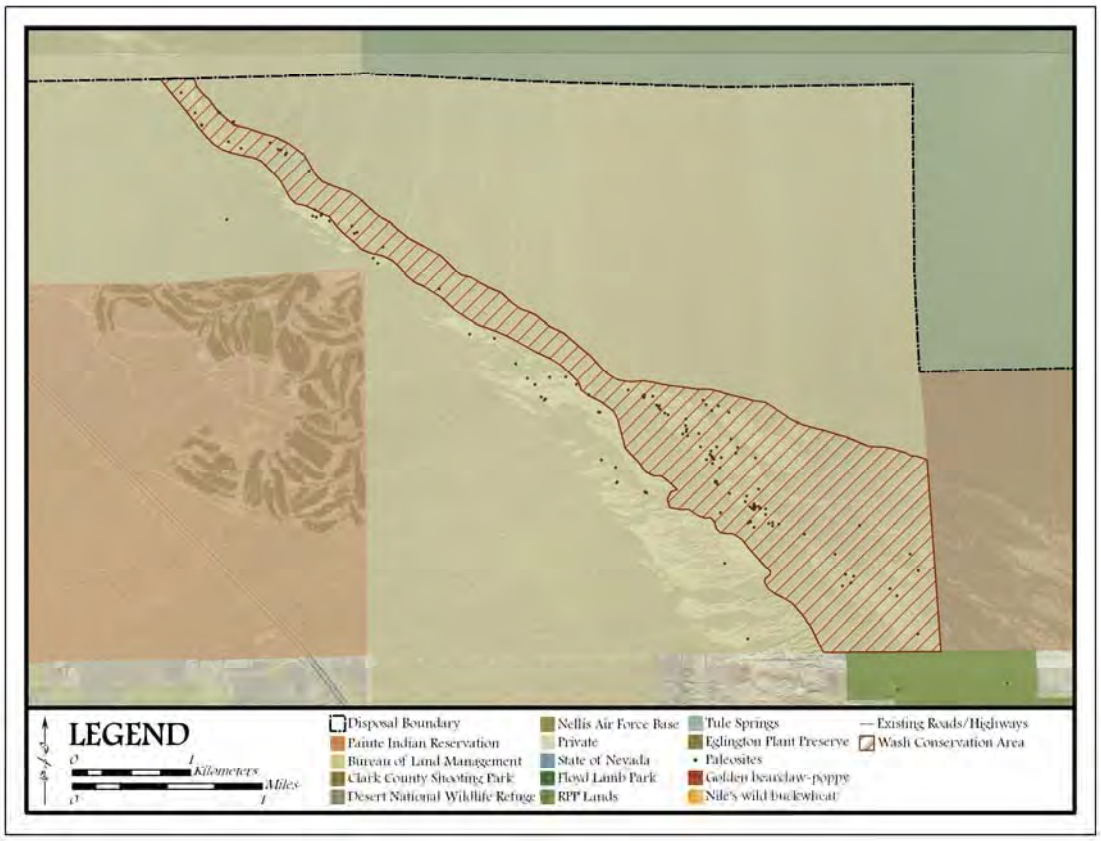
This alternative component represents a one mile buffer (1.6 km) on the north and east sides of the Paiute Indian Reservation. The existence of a one mile buffer would fulfill the request of the Paiute Tribe of Las Vegas, Nevada; however, it would provide only a minimal amount of urban development adjacent to the reservation in the northwest portion of the disposal area. Because a one mile buffer would prevent any development to the north of the reservation, it may also preserve intact plant communities representative of the Mojave Desert. The existence of a one mile buffer should provide protection from visual and social nuisances associated with the construction and existence of adjacent residential subdivisions and associated transportation networks. The width of the buffer provides the maximum amount of protection for any potential Native American artifacts or burial sites within the North Las Vegas Wash and it may be more than adequate to prevent any adverse social impacts and to maintain the economic benefits of the Las Vegas Paiute Golf Resort.

AREA: 4,026 acres (1,629 hectares)

ASSESSMENT METRICS

- Cultural resources (Native American artifacts and burial sites)
- Visual quality (distance to residential development; vistas of wash and wildlife refuge)
- Road traffic noise (distance to roadway; speed of roadway; average vehicles per hour)
- Air quality (dust from construction sites, roads, and recreation)
- Social impacts (littering; vandalism; unregulated motorized vehicle use)

NORTHWEST UPPER LAS VEGAS WASH (B1)



ACTIVE WASH (B1)

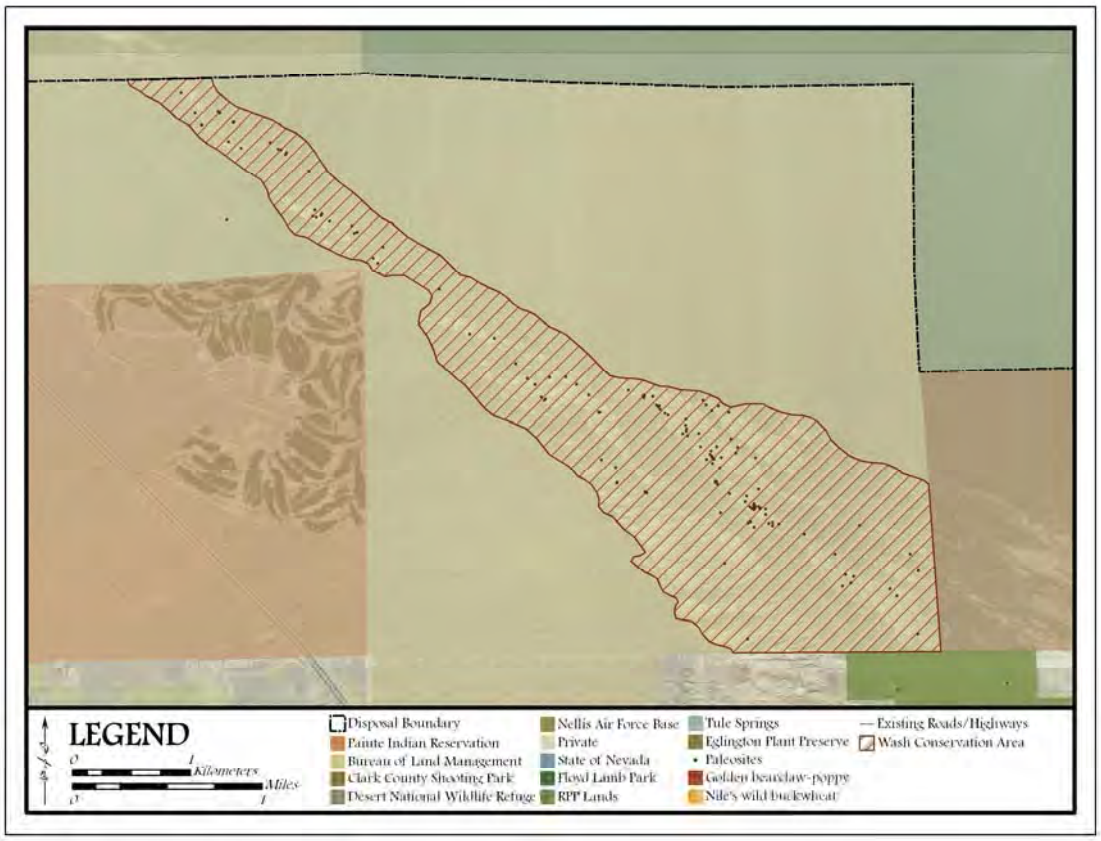
This alternative component represents the preservation of the active wash (Quaternary active wash deposits) and the adjacent floodplains. This configuration would allow the greatest amount of urban development adjacent to the northwest portion of the Upper Las Vegas Wash while preserving the minimum land necessary for natural water flow. The active wash boundary was delineated using photo interpretation methods and data derived from the United States Geological Survey (USGS) geologic and geophysical data of the Las Vegas quadrangle.

AREA: 1,211 acres (490 hectares)

ASSESSMENT METRICS

- Quaternary active wash deposits
  - Qayy [Youngest alluvium (Holocene)] - Noncemented alluvial-fan gravel and sand of intermittently active wash complexes.
- 100-year floodplain

NORTHWEST UPPER LAS VEGAS WASH (B2)



PALEONTOLOGICAL RESOURCES (B2)

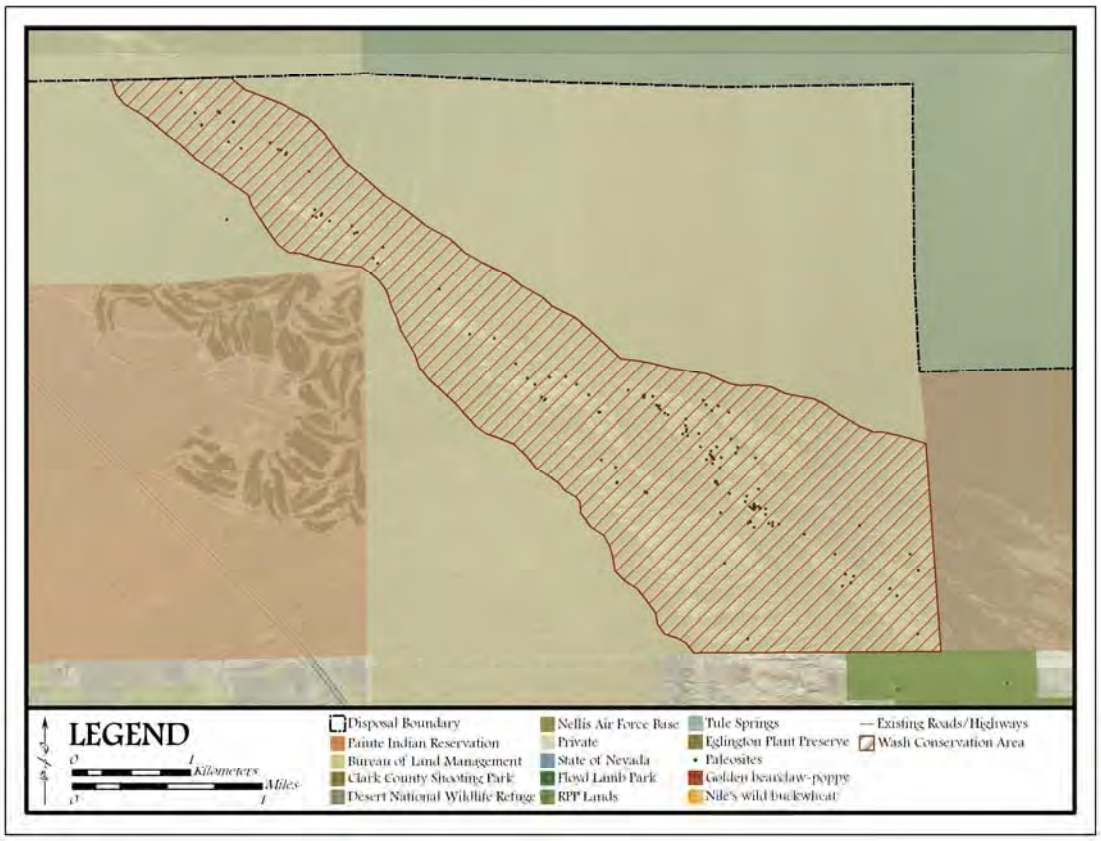
This alternative component represents the preservation of paleontological resources and the fossiliferous Quaternary spring deposits associated with fossils of late Pleistocene megafauna. This configuration would provide a moderate amount of urban development adjacent to the northwest portion of the Upper Las Vegas Wash while preserving valuable fossils that may increase the understanding of the history of life on Earth. The paleontological resources boundary was delineated using photo interpretation methods and data derived from the United States Geological Survey (USGS) geologic and geophysical data of the Las Vegas quadrangle.

AREA: 1,919 acres (776 hectares)

ASSESSMENT METRICS

- Paleontological resources
  - Fossiliferous Quaternary spring deposits
    - Qscd [Intermediate fine-grained deposits associated with past groundwater discharge (late Pleistocene)] - Top 1 to 2 meters is characteristically resistant light-gray calcareous mud that is particularly cemented with calcite.
    - Qse [Young fine-grained deposits associated with past groundwater discharge (early Holocene to latest Pleistocene)] - Light-gray to light-brown unconsolidated silt, sandy silt, and mud. Locally contains aquatic and terrestrial mollusk shells and fossils of late Pleistocene megafauna, including mammoth, bison, horse, and camel.
    - Qsu [Undivided young and intermediate fine-grained deposits associated with past groundwater discharge (early Holocene and late Pleistocene) - Includes units Qse and Qscd.

NORTHWEST UPPER LAS VEGAS WASH (B3)



WASH ECOSYSTEM (B3)

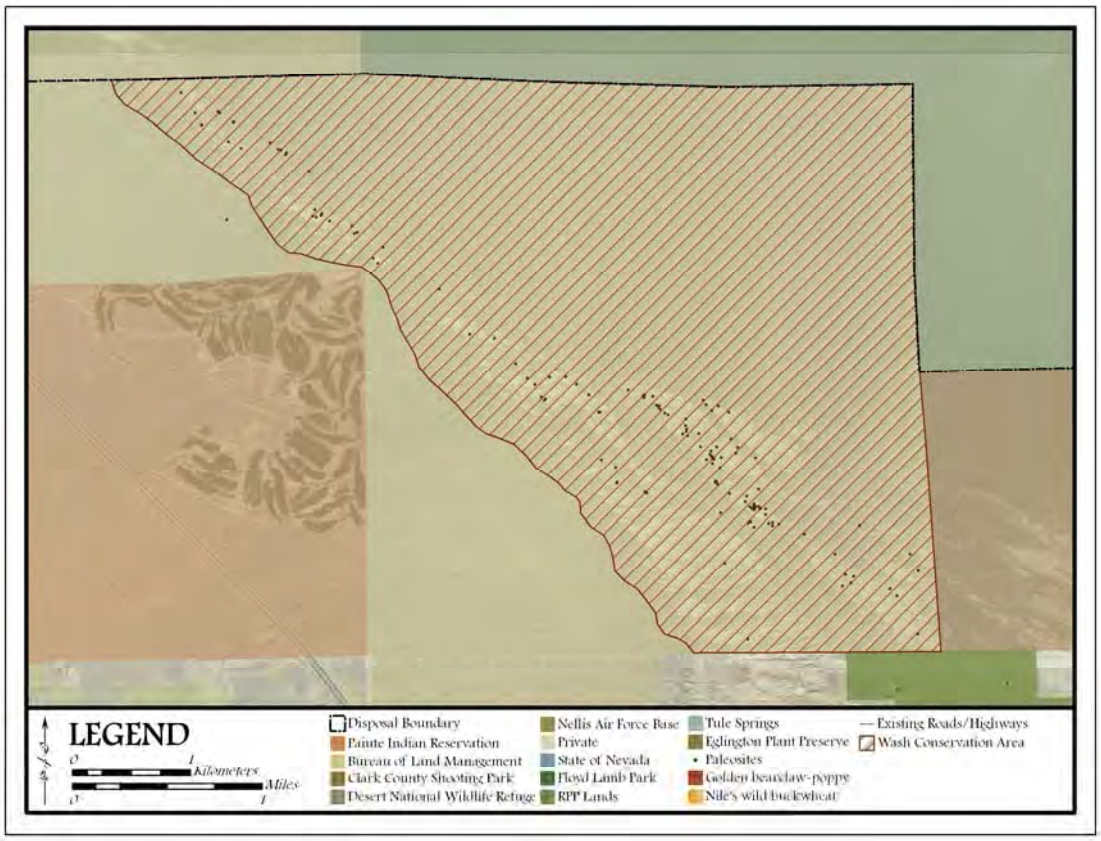
This alternative component represents the preservation of the northwest portion of the Upper Las Vegas Wash ecosystem. This includes the conservation of plant and animal communities representative of an arid wash ecosystem as well as the conservation of paleontological resources and fossiliferous Quaternary spring deposits within the wash environment. This configuration would provide a minimum to moderate amount of urban development adjacent to the northwest portion of the Upper Las Vegas Wash while preserving the ecological functioning of the wash. The wash ecosystem boundary was delineated using a combination of the active wash and paleontological resources boundaries in addition to including an ecological buffer, approximately one-tenth of a mile (0.16 km) wide.

AREA: 2,517 acres (1,019 hectares)

ASSESSMENT METRICS

- Ecological functioning of the wash ecosystem
- Paleontological resources
  - Fossiliferous Quaternary spring deposits
    - Qscd [Intermediate fine-grained deposits associated with past groundwater discharge]
    - Qse [Young fine-grained deposits associated with past groundwater discharge
    - Qsu [Undivided young and intermediate fine-grained deposits associated with past groundwater discharge]
- Quaternary active wash deposits
  - Qayy [Youngest alluvium]

NORTHWEST UPPER LAS VEGAS WASH (B4)



MOJAVE DESERT ECOSYSTEM (B4)

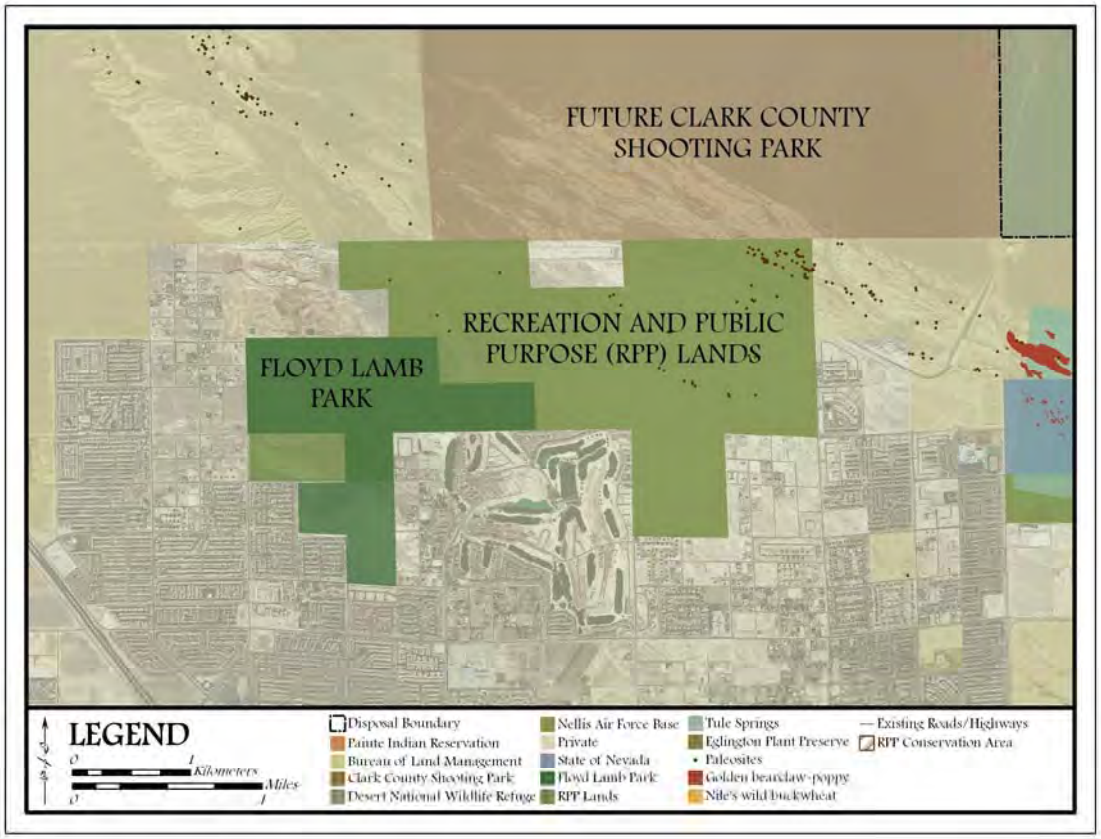
This alternative component represents the preservation of an intact portion of the Mojave Desert ecosystem that would neighbor the Desert National Wildlife Refuge. This includes the conservation of plant and animal communities representative of the Mojave Desert as well as the conservation of paleontological resources and fossiliferous Quaternary spring deposits within the Mojave Desert environment. This configuration would provide the least amount of urban development adjacent to the northwest portion of the Upper Las Vegas Wash, but it would sustain the ecological functioning of the northwest portion of the Upper Las Vegas Wash, the bajada of the Sheep Range, and a community representative of the Mojave Desert.

AREA: 5,105 acres (2,066 hectares)

ASSESSMENT METRICS

- Representative plant communities of the Mojave Desert
- Ecological and hydrological functioning of the wash ecosystem
- Paleontological resources
  - Fossiliferous Quaternary spring deposits
    - Qscd [Intermediate fine-grained deposits associated with past groundwater discharge]
    - Qse [Young fine-grained deposits associated with past groundwater discharge
    - Qsu [Undivided young and intermediate fine-grained deposits associated with past groundwater discharge]
- Quaternary active wash deposits
  - Qayy [Youngest alluvium]

RECREATION AND PUBLIC PURPOSE LANDS (C1)



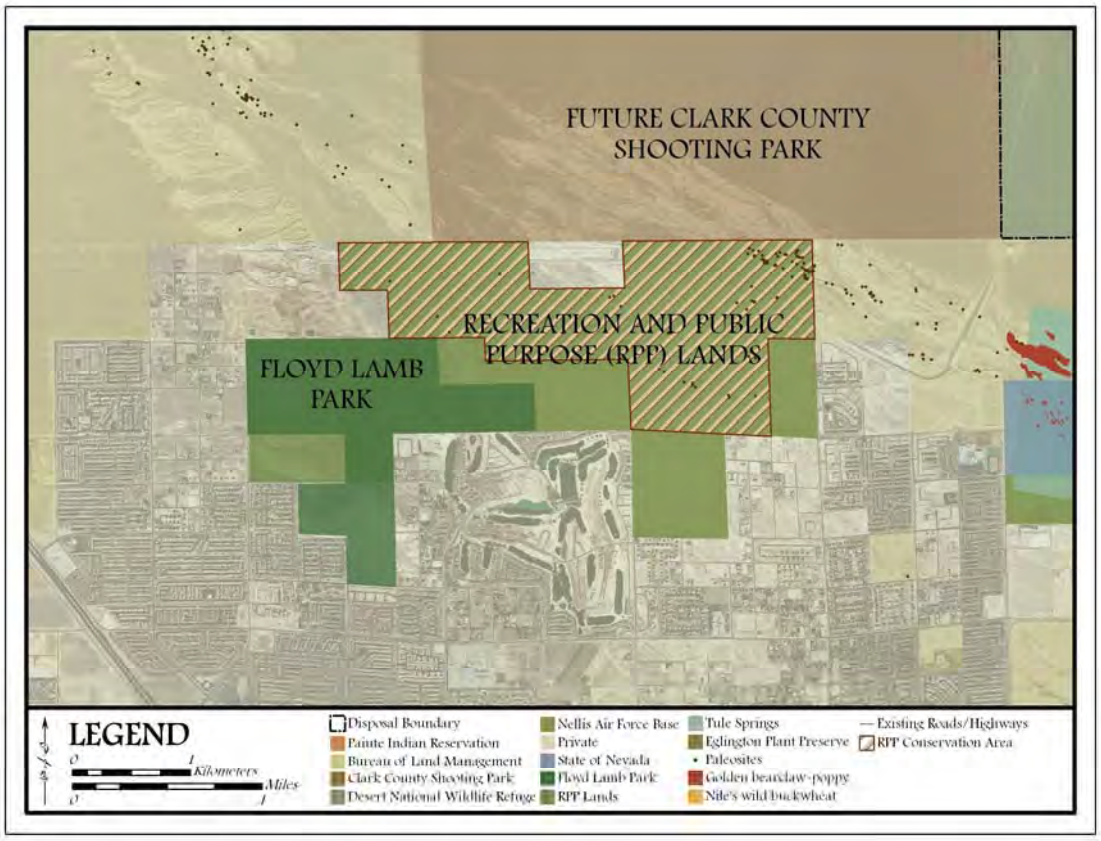
NO RECREATION AND PUBLIC PURPOSE LANDS (C1)

This alternative component represents the exclusion of Recreation and Public Purpose lands (lands leased from the Bureau of Land Management) from the designated conservation transfer area. No recommendations will be made regarding the future uses of the area. The Recreation and Public Purpose lands may indirectly serve as areas of access into the authorized wash conservation areas, but will be utilized and maintained as specified in the Floyd Lamb Park Master Plan and consistent with the plan of development amendment as approved by the Bureau of Land Management.

ASSESSMENT METRICS

- Connectivity of the Upper Las Vegas Wash
- Paleontological resources
  - Fossiliferous Quaternary spring deposits
    - Qscd [Intermediate fine-grained deposits associated with past groundwater discharge]
    - Qse [Young fine-grained deposits associated with past groundwater discharge
    - Qsu [Undivided young and intermediate fine-grained deposits associated with past groundwater discharge]
- Cultural resources
- Non-motorized recreation (hiking, biking, and equestrian trails)
- Social impacts (littering; vandalism; unregulated motorized vehicle use)

RECREATION AND PUBLIC PURPOSE LANDS (C2)



RECREATION AND PUBLIC PURPOSE LANDS WITH NO DESIGNATED USE (C2)

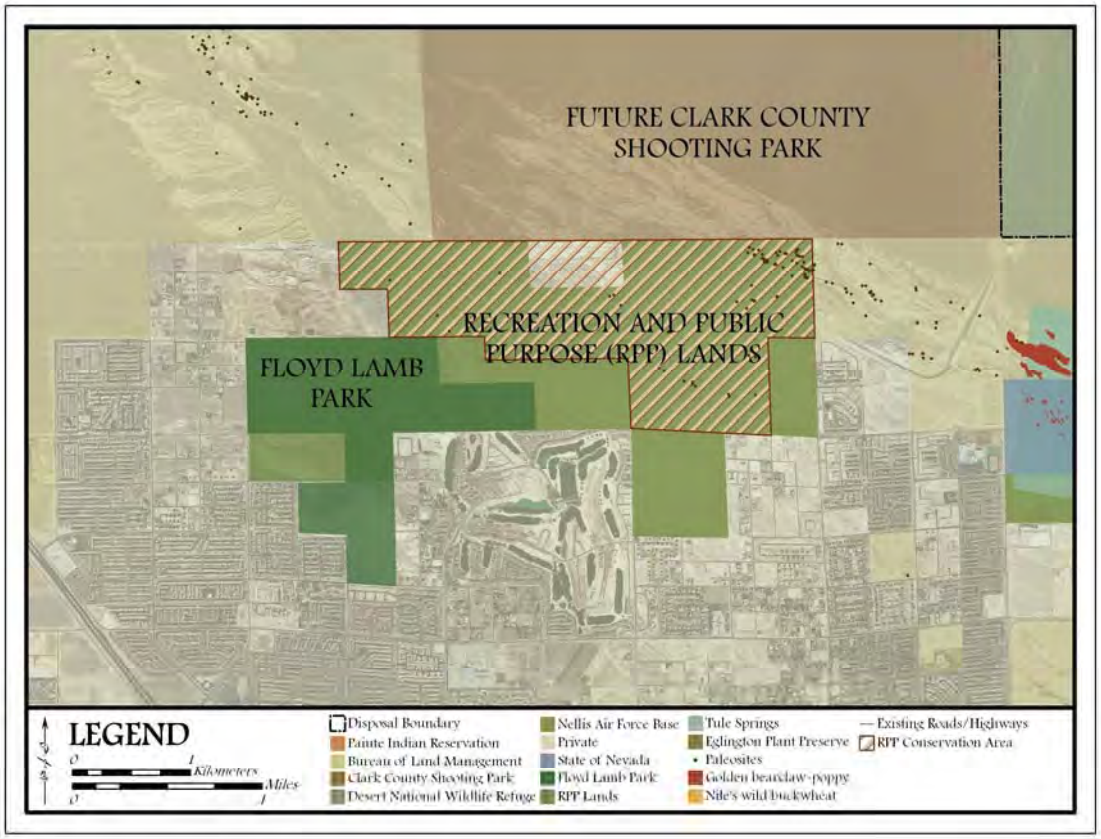
This alternative component represents the inclusion of Recreation and Public Purpose lands (lands leased from the Bureau of Land Management) which currently have no designated use or plan into the conservation transfer area. This indicates that recommendations will be made by the Las Vegas Bureau of Land Management based on the field data and social survey results regarding the future uses of the lands. The inclusion of these lands will connect the northwest and southeast wash conservation transfer areas to maintain continuity within the Upper Las Vegas Wash for ecological and recreational functions.

AREA: 988 acres (400 hectares)

ASSESSMENT METRICS

- Connectivity of the Upper Las Vegas Wash
- Paleontological resources
  - Fossiliferous Quaternary spring deposits
    - Qscd [Intermediate fine-grained deposits associated with past groundwater discharge]
    - Qse [Young fine-grained deposits associated with past groundwater discharge
    - Qsu [Undivided young and intermediate fine-grained deposits associated with past groundwater discharge]
- Cultural resources
- Non-motorized recreation (hiking, biking, and equestrian trails)
- Social impacts (littering; vandalism; unregulated motorized vehicle use)

RECREATION AND PUBLIC PURPOSE LANDS (C3)



RECREATION AND PUBLIC PURPOSE LANDS WITH NO DESIGNATED USE AND PRIVATELY-OWNED PARCEL (C3)

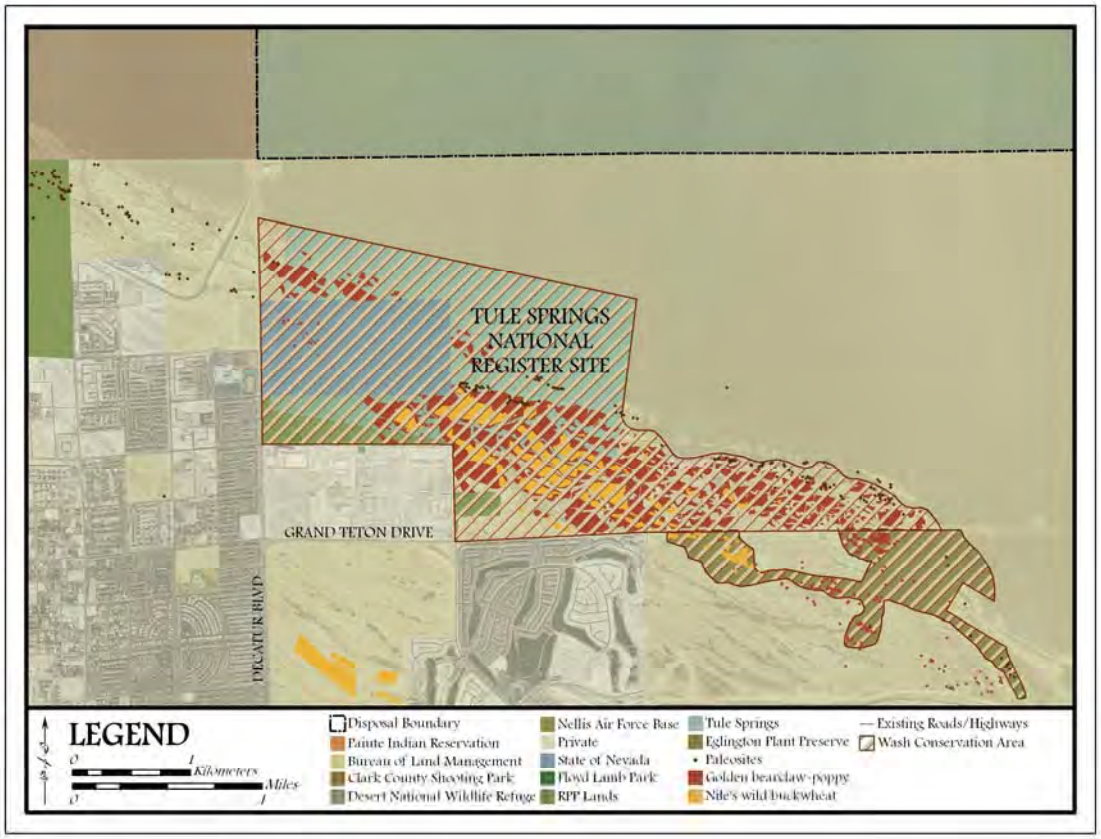
This alternative component represents the inclusion of Recreation and Public Purpose lands (lands leased from the Bureau of Land Management) which currently have no designated use or plan and the 81 acre (33 hectare) privately-owned parcel into the conservation transfer area. Although the privately-owned parcel appears land-locked by the Recreation and Public Purpose lands and the future Clark County Shooting Park, the proposed Mountain Edge Beltway may provide future access for development if constructed. Therefore, the parcel should be acquired, either purchased or exchanged for another parcel outside of the North Las Vegas Wash, to provide and potentially enhance the connectivity within the Upper Las Vegas Wash for ecological and recreational functions.

AREA: 1,069 acres (433 hectares)

ASSESSMENT METRICS

- Connectivity of the Upper Las Vegas Wash
- Paleontological resources
  - Fossiliferous Quaternary spring deposits
    - Qscd [Intermediate fine-grained deposits associated with past groundwater discharge]
    - Qse [Young fine-grained deposits associated with past groundwater discharge
    - Qsu [Undivided young and intermediate fine-grained deposits associated with past groundwater discharge]
- Cultural resources
- Non-motorized recreation (hiking, biking, and equestrian trails)
- Social impacts (littering; vandalism; unregulated motorized vehicle use)

SOUTHEAST UPPER NORTH LAS VEGAS WASH (D1)



RARE PLANT SPECIES (D1)

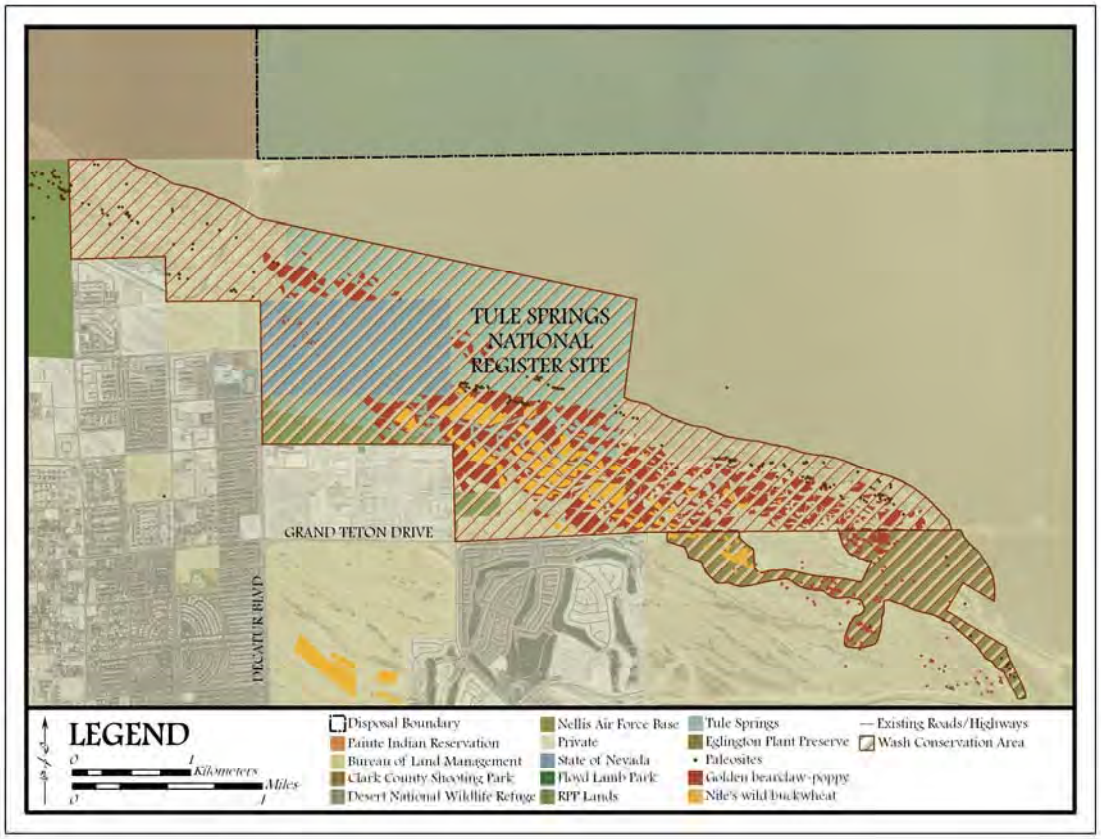
This alternative component represents the preservation of rare, sensitive, and endemic plant species with an emphasis on preserving the Golden bearclaw-poppy (*Arctomecon californica* Torrey and Frémont) and Nile's wild buckwheat (*Eriogonum corymbosum* Bentham var. *nilesii* Reveal) within the Upper Las Vegas Wash. This configuration would provide the greatest amount of urban development adjacent to the southeast portion of the Upper Las Vegas Wash while maintaining the habitat required for viable populations of rare plant species. The rare plant species boundary was delineated based on previously surveyed populations of the Golden bearclaw-poppy and Nile's wild buckwheat.

AREA: 622 acres (251 hectares); **TOTAL AREA:** 2,157 acres (873 hectares) [includes Tule Springs National Register Site, State Land, Recreation and Public Purpose Lands, and Eglington Plant Preserve]

ASSESSMENT METRICS

- Golden bearclaw-poppy (*Arctomecon californica* Torrey and Frémont)
- Nile's wild buckwheat (*Eriogonum corymbosum* Bentham var. *nilesii* Reveal)

SOUTHEAST UPPER NORTH LAS VEGAS WASH (D2)



PALEONTOLOGICAL RESOURCES AND RARE PLANT SPECIES (D2)

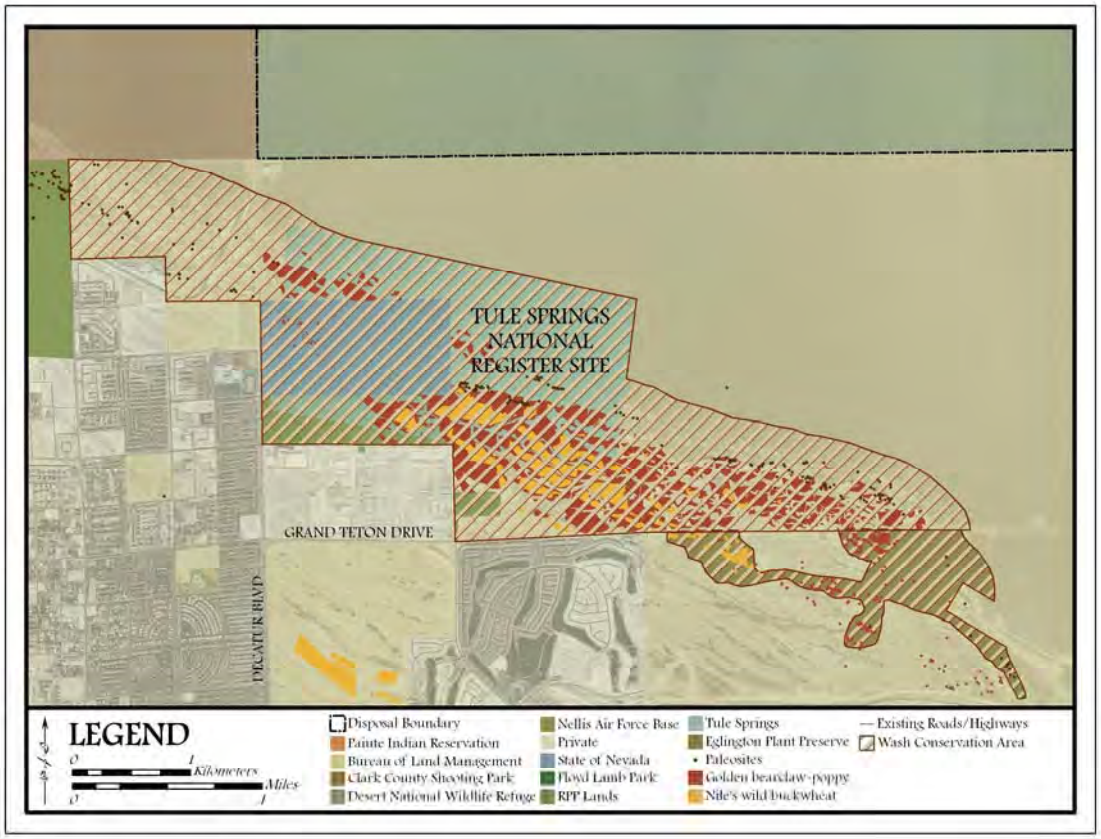
This alternative component represents the preservation of paleontological resources and the fossiliferous Quaternary spring deposits associated with fossils of late Pleistocene megafauna and the preservation of rare, sensitive, and endemic plant species with an emphasis on preserving the Golden bearclaw-poppy (*Arctomecon californica* Torrey and Frémont) and Nile's wild buckwheat (*Eriogonum corymbosum* Bentham var. *nilesii* Reveal) within the Upper Las Vegas Wash. This configuration would provide the greatest amount of urban development adjacent to the southeast portion of the Upper Las Vegas Wash while maintaining the habitat required for viable populations of rare plant species and preserving valuable fossils that may increase the understanding of the history of life on Earth. The paleontological resources and rare plant species boundary was delineated based on previously surveyed paleosites and populations of the Golden bearclaw-poppy and Nile's wild buckwheat, as well as photo-interpretation methods based on data derived from the United States Geological Survey (USGS) geologic and geophysical data of the Las Vegas quadrangle.

AREA: 1,067 acres (431 hectares); **TOTAL AREA:** 2,602 acres (1,053 hectares) [includes Tule Springs National Register Site, State Land, Recreation and Public Purpose Lands, and Eglington Plant Preserve]

ASSESSMENT METRICS

- Paleontological resources
  - Fossiliferous Quaternary spring deposits
    - Qscd [Intermediate fine-grained deposits associated with past groundwater discharge]
    - Qse [Young fine-grained deposits associated with past groundwater discharge
    - Qsu [Undivided young and intermediate fine-grained deposits associated with past groundwater discharge]
  - Maintenance of Tule Springs National Register Site
- Golden bearclaw-poppy (*Arctomecon californica* Torrey and Frémont)
- Nile's wild buckwheat (*Eriogonum corymbosum* Bentham var. *nilesii* Reveal)

SOUTHEAST UPPER NORTH LAS VEGAS WASH (D3)



WASH ECOSYSTEM I (D3)

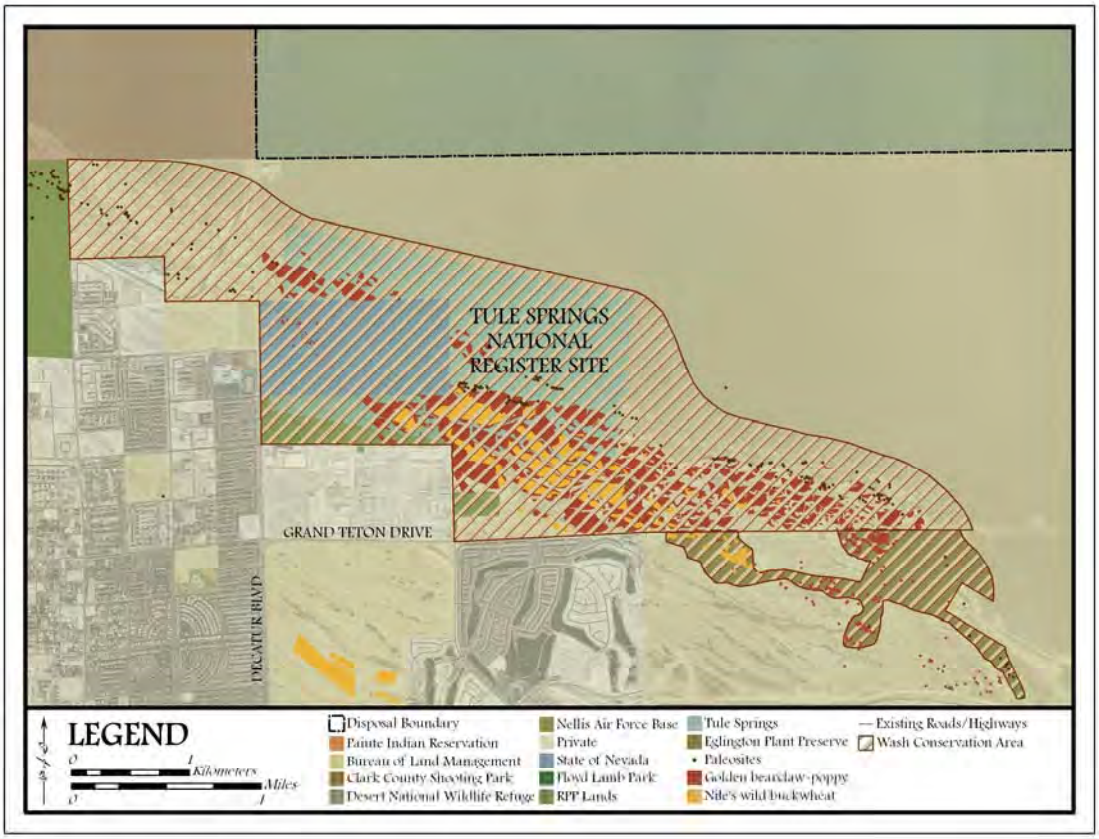
This alternative component represents the preservation of the southwest portion of the Upper Las Vegas Wash ecosystem. In addition to the elements preserved in component D2, this component incorporates the conservation of the ecological functioning of the wash ecosystem and conservation of plant and animal communities representative of an arid wash ecosystem. This is displayed by including an ecological buffer, approximately one-tenth of a mile (0.16 km) wide. This configuration would provide a moderate amount of urban development adjacent to the southeast portion of the Upper Las Vegas Wash while preserving sustained populations of rare plants, conserving valuable fossils that may increase the understanding of the history of life on Earth, and maintaining the ecological functioning of the wash.

AREA: 1,255 acres (508 hectares); **TOTAL AREA:** 2,790 acres (1,130 hectares) [includes Tule Springs National Register Site, State Land, Recreation and Public Purpose Lands, and Eglington Plant Preserve]

ASSESSMENT METRICS

- Ecological functioning of the wash ecosystem
- Paleontological resources
  - Fossiliferous Quaternary spring deposits
    - Qscd [Intermediate fine-grained deposits associated with past groundwater discharge]
    - Qse [Young fine-grained deposits associated with past groundwater discharge
    - Qsu [Undivided young and intermediate fine-grained deposits associated with past groundwater discharge]
  - Maintenance of Tule Springs National Register Site
- Golden bearclaw-poppy (*Arctomecon californica* Torrey and Frémont)
- Nile's wild buckwheat (*Eriogonum corymbosum* Bentham var. *nilesii* Reveal)
- Quaternary active wash deposits
  - Qayy [Youngest alluvium]

SOUTHEAST UPPER NORTH LAS VEGAS WASH (D4)



WASH ECOSYSTEM II (D4)

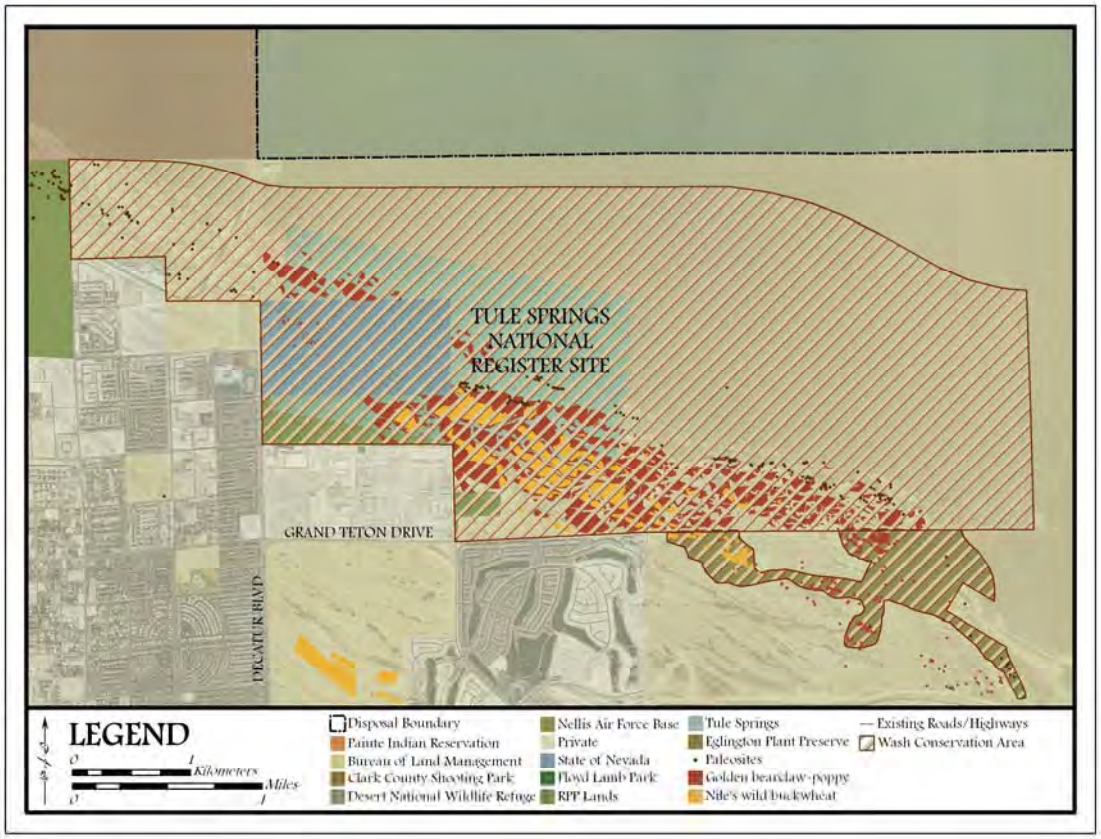
This alternative component represents the preservation of the southwest portion of the Upper Las Vegas Wash ecosystem. This component incorporates an enlarged wash conservation area which encompasses a portion of the lower bajada in order to preserve the plant and animal communities of the wash ecosystem, populations of rare plant species, and paleontological resources and fossiliferous Quaternary spring deposits within the wash environment. This configuration would provide a minimum to moderate amount of urban development adjacent to the southeast portion of the Upper Las Vegas Wash, but would sustain populations of rare plants, conserve valuable fossils that may increase the understanding of the history of life on Earth, and maintain the ecological functioning of the wash (see component E3).

AREA: 1,405 acres (569 hectares); **TOTAL AREA:** 2,940 acres (1,190 hectares) [includes Tule Springs National Register Site, State Land, Recreation and Public Purpose Lands, and Eglington Plant Preserve]

ASSESSMENT METRICS

- Ecological functioning of the wash ecosystem
- Paleontological resources
  - Fossiliferous Quaternary spring deposits
    - Qscd [Intermediate fine-grained deposits associated with past groundwater discharge]
    - Qse [Young fine-grained deposits associated with past groundwater discharge
    - Qsu [Undivided young and intermediate fine-grained deposits associated with past groundwater discharge]
  - Maintenance of Tule Springs National Register Site
- Golden bearclaw-poppy (*Arctomecon californica* Torrey and Frémont)
- Nile's wild buckwheat (*Eriogonum corymbosum* Bentham var. *nilesii* Reveal)
- Quaternary active wash deposits
  - Qayy [Youngest alluvium]

SOUTHEAST UPPER NORTH LAS VEGAS WASH (D5)



MOJAVE DESERT ECOSYSTEM I (D5)

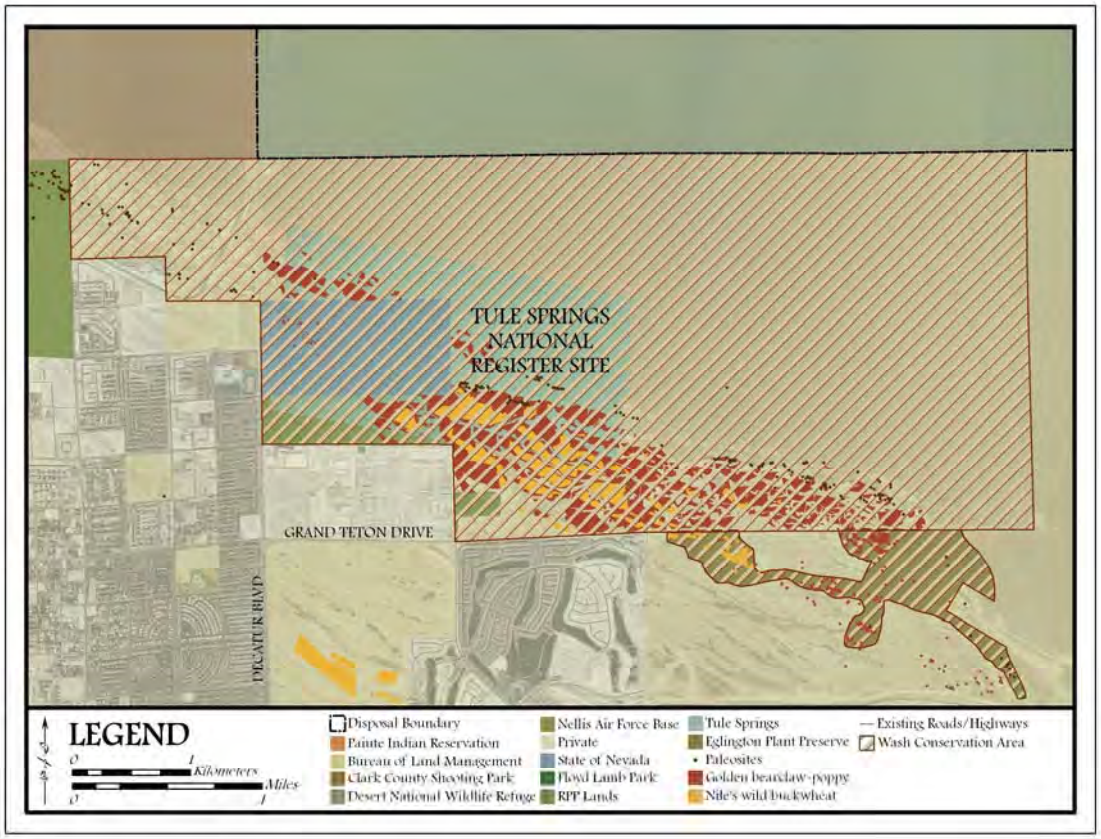
This alternative component represents the preservation of an intact portion of the Mojave Desert ecosystem which would be bound by the proposed Mountain Edge Beltway (see component E2). This component includes the conservation of plant and animal communities representative of the Mojave Desert, as well as the conservation of rare plant species, paleontological resources and fossiliferous Quaternary spring deposits within the southeast portion of the Upper Las Vegas Wash. This configuration would allow a minimal amount of urban development, but it would sustain the ecological functioning of the southeast portion of the wash and a community representative of the Mojave Desert.

AREA: 3,309 acres (1,339 hectares); **TOTAL AREA:** 4,844 acres (1,961 hectares) [includes Tule Springs National Register Site, State Land, Recreation and Public Purpose Lands, and Eglington Plant Preserve]

ASSESSMENT METRICS

- Representative plant communities of the Mojave Desert
- Ecological functioning of the wash ecosystem
- Paleontological resources
  - Fossiliferous Quaternary spring deposits
    - · Qscd [Intermediate fine-grained deposits associated with past groundwater discharge]
    - · Qse [Young fine-grained deposits associated with past groundwater discharge
    - · Qsu [Undivided young and intermediate fine-grained deposits associated with past groundwater discharge]
  - Maintenance of Tule Springs National Register Site
- Golden bearclaw-poppy (*Arctomecon californica* Torrey and Frémont)
- Nile's wild buckwheat (*Eriogonum corymbosum* Bentham var. *nilesii* Reveal)
- Quaternary active wash deposits
  - Qayy [Youngest alluvium]

SOUTHEAST UPPER NORTH LAS VEGAS WASH (D6)



MOJAVE DESERT ECOSYSTEM II (D6)

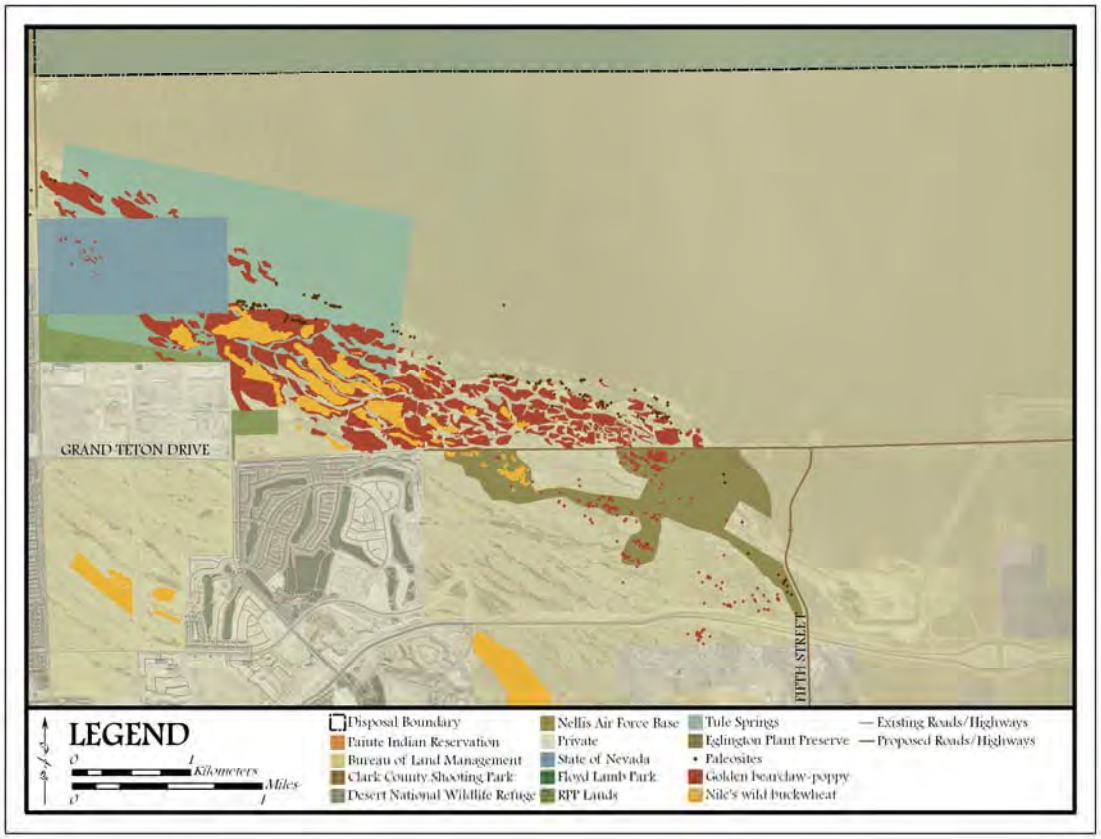
This alternative component represents the preservation of an intact portion of the Mojave Desert ecosystem which would be connected to the wildlife refuge (see component E1). This component includes the conservation of plant and animal communities representative of the Mojave Desert, as well as the conservation of rare plant species, paleontological resources and fossiliferous Quaternary spring deposits within the southeast portion of the Upper Las Vegas Wash. This configuration would provide the least amount of urban development, but it would sustain the ecological and hydrological functioning of the southeast portion of the wash and the bajada of the Sheep Range and a community representative of the Mojave Desert.

AREA: 4,047 acres (1,637 hectares); **TOTAL AREA:** 5,582 acres (2,259 hectares) [includes Tule Springs National Register Site, State Land, Recreation and Public Purpose Lands, and Eglington Plant Preserve]

ASSESSMENT METRICS

- Representative plant communities of the Mojave Desert
- Ecological and hydrological functioning of the wash ecosystem
- Paleontological resources
  - Fossiliferous Quaternary spring deposits
    - · Qscd [Intermediate fine-grained deposits associated with past groundwater discharge]
    - · Qse [Young fine-grained deposits associated with past groundwater discharge
    - · Qsu [Undivided young and intermediate fine-grained deposits associated with past groundwater discharge]
  - Maintenance of Tule Springs National Register Site
- Golden bearclaw-poppy (*Arctomecon californica* Torrey and Frémont)
- Nile's wild buckwheat (*Eriogonum corymbosum* Bentham var. *nilesii* Reveal)
- Quaternary active wash deposits
  - Qayy [Youngest alluvium]

MOUNTAIN EDGE BELTWAY (E1)



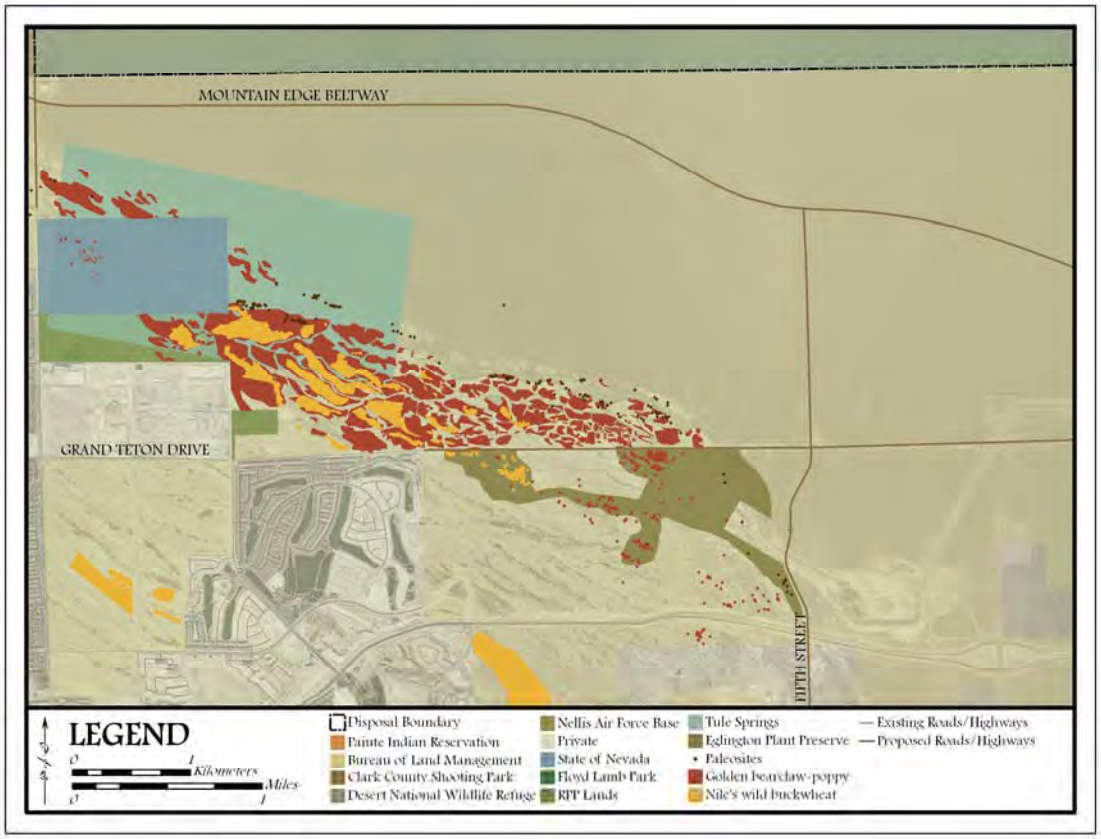
NO MOUNTAIN EDGE BELTWAY (E1)

This alternative component represents the exclusion of future roads and highways (i.e. Mountain Edge Beltway) north of Grand Teton Drive in the area adjacent to the southeast portion of the North Las Vegas Wash. This component may be paired with Mojave Desert Ecosystem II (D6).

ASSESSMENT METRICS

- Representative plant communities of the Mojave Desert
- Ecological and hydrological functioning of the wash ecosystem
- Paleontological resources
  - Fossiliferous Quaternary spring deposits
    - Qscd [Intermediate fine-grained deposits associated with past groundwater discharge]
    - Qse [Young fine-grained deposits associated with past groundwater discharge
    - Qsu [Undivided young and intermediate fine-grained deposits associated with past groundwater discharge]
  - Maintenance of Tule Springs National Register Site
- Golden bearclaw-poppy (*Arctomecon californica* Torrey and Frémont)
- Nile's wild buckwheat (*Eriogonum corymbosum* Bentham var. *nilesii* Reveal)
- Quaternary active wash deposits
  - Qayy [Youngest alluvium]

MOUNTAIN EDGE BELTWAY (E2)



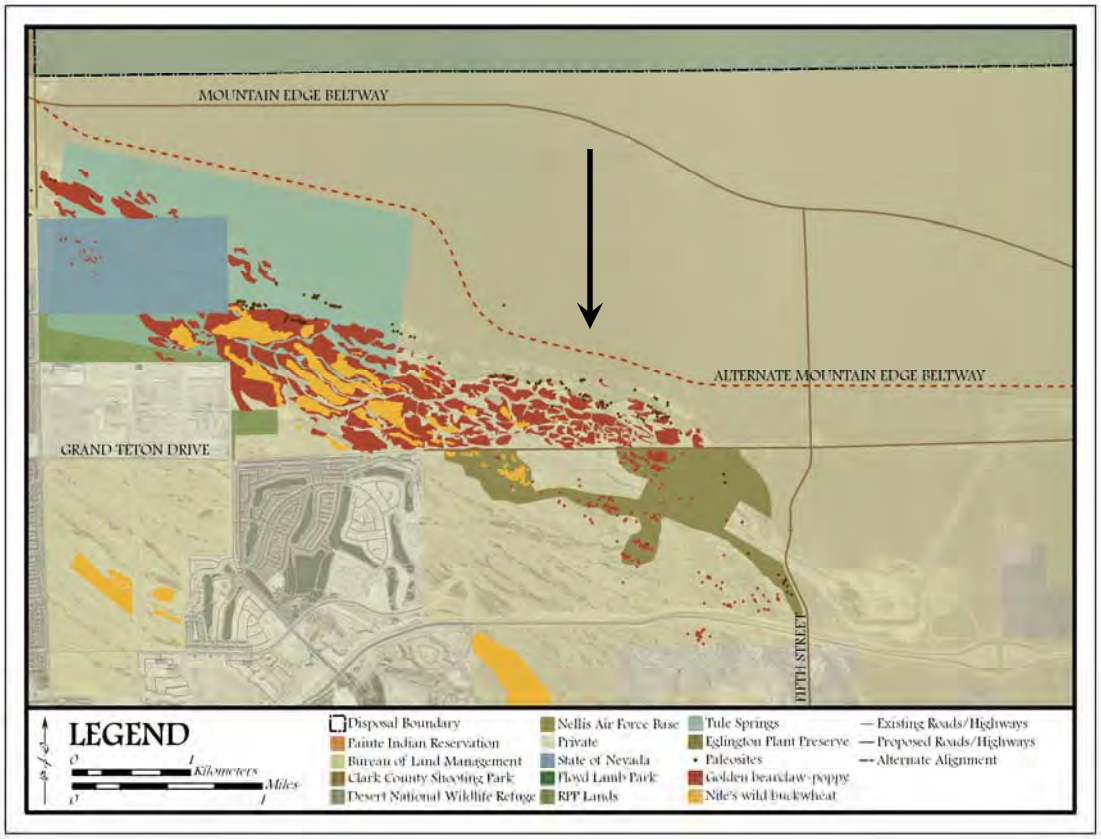
PROPOSED ALIGNMENT (E2)

This alternative component represents the proposed alignment of Mountain Edge Beltway and the extension of Fifth Street. This component was considered by the Utah State University team because a major transportation artery is necessary for public safety if development is to occur in the area. However, roads bisecting the wash or areas of concern may cause irreparable harm. This component may be paired with components Rare Plant Species (D1), Paleontological Resources and Rare Plant Species (D2), Wash Ecosystem I (D3), Wash Ecosystem II (D4), or Mojave Desert Ecosystem I (D5).

ASSESSMENT METRICS

- Ecological functioning of the wash ecosystem
- Paleontological resources
  - Fossiliferous Quaternary spring deposits
    - Qscd [Intermediate fine-grained deposits associated with past groundwater discharge]
    - Qse [Young fine-grained deposits associated with past groundwater discharge
    - Qsu [Undivided young and intermediate fine-grained deposits associated with past groundwater discharge]
  - Maintenance of Tule Springs National Register Site
- Golden bearclaw-poppy (*Arctomecon californica* Torrey and Frémont)
- Nile's wild buckwheat (*Eriogonum corymbosum* Bentham var. *nilesii* Reveal)
- Quaternary active wash deposits
  - Qayy [Youngest alluvium]

MOUNTAIN EDGE BELTWAY (E3)



ALTERNATE ALIGNMENT (E3)

This alternative component represents an alternate alignment of Mountain Edge Beltway. The realignment of this proposed beltway was considered for the purpose of preserving the southeast portion of the Upper Las Vegas Wash while providing public safety. The alternate alignment can serve two scenarios to ensure the wash will be protected from encroachment of future urban land uses. The beltway may be utilized as an access barrier or it may be used as a limited access road with high-end, low-density housing in the developable parcels south of the beltway. As an access barrier, the beltway may not only protect the wash, but it may provide scenic views of the Las Vegas Valley over the wash. This component may be paired with the Wash Ecosystem II (D4). As a limited access road, it can protect the wash with high-end, low-density housing serving as a social barrier. This scenario may be paired with the Rare Plant Species (D1), Paleontological Resources and Rare Plant Species (D2), or Wash Ecosystem I (D3). Other alignments may be considered by stakeholders to achieve similar objectives.

ASSESSMENT METRICS

- Ecological functioning of the wash ecosystem
- Paleontological resources
  - Fossiliferous Quaternary spring deposits
    - Qscd [Intermediate fine-grained deposits associated with past groundwater discharge]
    - Qse [Young fine-grained deposits associated with past groundwater discharge
    - Qsu [Undivided young and intermediate fine-grained deposits associated with past groundwater discharge]
  - Maintenance of Tule Springs National Register Site
- Golden bearclaw-poppy (*Arctomecon californica* Torrey and Frémont)
- Nile's wild buckwheat (*Eriogonum corymbosum* Bentham var. *nilesii* Reveal)
- Quaternary active wash deposits
  - Qayy [Youngest alluvium]
- Visual quality (views of the Upper Las Vegas Wash and the Las Vegas Valley from the beltway)

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Appendix L

HYDROLOGY AND EROSION ANALYSIS

BUREAU OF LAND MANAGEMENT
SEIS TECHNICAL SUPPORT
HYDROLOGY AND EROSION ANALYSIS
UPPER LAS VEGAS WASH
CLARK COUNTY, NEVADA

Prepared By:

Travis A. Kluthe, E.I.T.
Staff Professional

Reviewed By:

Charles E. Larson, P.E.
Principal Professional

January 2009
Project No. 85153

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1.0 INTRODUCTION

The Upper Las Vegas Wash (ULVW) is an ephemeral stream draining northern Las Vegas Valley. The ULVW flows through an alluvial fan and during significant flood events is subject to radical changes in shape, direction, depth, and flow carrying capacity (CCRFCD, 1999). In the process of completing a Supplemental Environmental Impact Statement (SEIS), the Bureau of Land Management (BLM) is required to investigate the impact several land disposal alternatives will have on the hydrology and erosion in the Conservation Transfer Area (CTA)—a 21 square mile tract of land in north Las Vegas Valley. The land disposal alternatives for the SEIS are presented in Table 1.1, including a baseline (existing) condition for this study.

TABLE 1.1
LAND DISPOSAL ALTERNATIVES INFORMATION

		Percent of CTA Area Available for Disposal[1]
Baseline	0	0
Alternative A	371	3
Alternative B	2,316	18
Alternative C	6,961	55
Alternative D	8,023	64
Alternative E	10,010	79
No-Action Alternative	12,150	96

[1]Total land area in CTA study boundary is 12,623 ac.

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2.0 METHODS AND APPROACH

Future development will have both a direct and indirect impact on the hydrologic and erosive processes occurring in and near the Upper Las Vegas Wash (ULVW). More impervious surfaces from future development will cause increased surface runoff and higher peak flows in the ULVW. The frequency and volume of significant flood events will also be affected by the land disposal alternatives. More specifically, the 100-yr floodplain inundation area will be increased due to higher flows in the wash, assuming no change to existing flood control infrastructure.

The most important erosion mechanisms occurring in the area are surface erosion from overland and sheet flow and streambank erosion from significant flood events. The Simple Method (Schueler, 1987) was used to analyze surface erosion and the Hydrologic Engineering Center's River Analysis System (HEC-RAS) sediment transport routines were used in analyzing streambank erosion. A comparative analysis approach was taken to estimate the effect different land disposal alternatives will have on both erosion mechanisms.

The two mechanisms are indirectly related and both operate primarily during large storm events, and would therefore be considered a cumulative process. Development that would occur as a result of land disposal may ultimately cause less surface erosion as large areas are covered with impervious surfaces such as streets, parking lots, and buildings (Wolman, 1967), as well as increased landscaping that is less susceptible to surface erosion. At the same time, more impervious surfaces can indirectly increase streambank erosion by increasing the frequency and magnitude of significant flood events (Leopold, 1968; Hammer, 1972).

2.1 SURFACE EROSION

The Simple Method is a method for estimating stormwater runoff pollutant loads for urban areas. The method uses annual rainfall depths, a runoff coefficient, and Total Suspended Solids (TSS) concentrations as a sediment surrogate to determine the annual stormwater sediment load. Equation 2-1 below shows the adapted version of the Simple Method for this study.

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$$L = R_i \times C_i \times A_i \times 1.23 \qquad (2\text{-}1)$$
$$R_i = R_{vi} \times P \times P_j$$

Where:

L = Annual sediment load (kg)
R_i = Annual runoff (ac-ft)
C_i = TSS concentration (mg/l)
A_i = Area (ac)
R_{vi} = Runoff coefficient
P = Annual rainfall (in)
P_j = Fraction of rainfall events that produce runoff (usually 0.9)

Calibrated runoff coefficients and TSS concentrations for the Las Vegas Valley were taken from Reginato and Piechota (2004). The future land uses were assumed to be 65 percent residential, 20 percent streets and roads, 10 percent commercial, and 5 percent parks and golf courses for all disposal areas. While there may be some uncertainty on how the land available for disposal will develop, land use percentages represent a general trend in local development and were determined by studying several urban areas near the CTA study area. These future land use allocations are reasonable approximations for a comparative analysis among alternatives. Non-disposal areas and the adjacent properties were assumed to remain in their baseline (existing) conditions.

A spreadsheet program was developed to calculate the average annual sediment loss from surface erosion for each alternative and the baseline condition. The fraction of land uses could be easily changed if needed to reflect different development conditions (e.g. 85 percent commercial, 15 percent streets and roads).

2.2 HYDROLOGY

The Hydrologic Engineering Center's Flood Hydrograph Package (HEC-1) was developed in the late 1960's and adopted by the Clark County Regional Flood Control District (CCRFCD) in 1999 for rainfall-runoff analyses. The hydrology of the CTA study area indirectly impacts the rate of streambank erosion and is the only variable in the sediment transport comparative analysis. The other key parameters in the sediment transport analysis (e.g. channel geometry, grain size distribution) remained the same among alternatives.

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Kleinfelder was unable to locate a complete existing conditions hydrologic model for the CTA study area. However, a future conditions HEC-1 rainfall-runoff model of the CTA study area and surrounding area was prepared by VTN Nevada (VTN, 2004) and obtained from the BLM and CCRFCD. Many of the parameters used in the rainfall-runoff models—such as basin area, slope, and routing methods—were taken from the original VTN report. The subbasin routing network was partially modified to reflect existing flow directions and was used in all of the land disposal alternative analyses. Given the unpredictable nature of future development and the comparative emphasis of the analysis, it was judged appropriate to use the same routing network for all analyses.

To maximize sensitivity in the comparative analysis, the contributing watershed (Figure 1) was re-defined to focus primarily on the CTA area. As such, the rainfall-runoff model was truncated to include only the CTA study area and selected contributing subbasins. Normally a rainfall-runoff model would include all contributing subbasins appropriate for a specific storm event, including those upstream of the area of interest. This rainfall-runoff model is “cut-down” to focus specifically on the CTA study area and the effects land disposal will have on the hydrology. Because some of the disposal alternatives are very similar, it was important not to include many subbasins outside of the CTA area that would dampen the changes in hydrology due to an increase in land area outside the CTA boundary being included in the hydrology model.

The rainfall-runoff model uses the Soils Conservation Service’s curve number method (SCS, 1975) and simulates a specific storm event for an 88 square mile area, incorporating the entire CTA study area and several contributing subbasins outside the CTA boundary. As recommended in CCRFCD’s Hydrologic Criteria and Drainage Design Manual (HCDDM), the model uses a 6-hr SDN5 storm distribution with the rainfall depths provided in Table 2.1.

TABLE 2.1
NORTH LAS VEGAS RAINFALL DEPTHS FOR DIFFERENT FREQUENCY STORM EVENTS

	6-hr Rainfall Depth (in)
100-yr	2.77
50-yr	2.41
25-yr	2.05
10-yr	1.58
5-yr	1.22
2-yr	0.72

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The rainfall-runoff model includes all existing flood control facilities, including the ULVW Detention Basin. The model does not reflect planned or proposed flood control facilities because it is currently beyond the scope of this comparative analysis to investigate the effects of additional infrastructure.

2.2.1 CURVE NUMBERS AND ROUTING

The Natural Resources Conservation Service (formerly Soil Conservation Service) Technical Release 55 (TR-55) was developed in 1975 and provides procedures to calculate storm runoff volume, peak discharge, hydrographs, and storage volumes required for floodwater reservoirs. The method is applicable to urbanizing watersheds and is appropriate for the CTA study area and adjacent subbasins.

Curve numbers (CNs) were developed for each subbasin according to the land disposal criteria outlined for each alternative. The CNs for subbasins not included in the land disposal area were not adjusted, thus reflecting no land use change. All subbasins included in the land disposal were adjusted using the same land development criteria to maintain a consistent comparative analysis.

Most subbasin runoff hydrographs were routed using the Muskingum-Cunge method requiring channel length, slope, roughness, and geometry. The remaining subbasin hydrographs were routed using the Muskingum method requiring a number of integer steps, Muskingum K coefficient and a Muskingum X coefficient. Where appropriate, these variables were adjusted to reflect future development within the disposal areas. A representative conveyance element for developed subbasins was defined as a V-channel with 50H:1V side slopes and a Manning's roughness value of 0.016.

2.2.2 SOIL TYPES AND LAND USES

Existing condition CNs were calculated using Utah State University (USU) soils data (Figure 2) and observed vegetation information. Soil types in the CTA study area are shown in Table 2.2 below and vegetation was considered to be a "fair desert shrub" throughout the entire CTA study area based on visual observation during site visits. Soils were assigned a hydrologic soil type (i.e. A, B, C, or D) according to Soils Survey of Clark County Area, Nevada (NRCS, 2006). In general, soil type A has a much lower runoff potential than soil types C or D.

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TABLE 2.2
HYDROLOGIC SOIL CLASSIFICATION FOR SOILS FOUND NEAR CTA, BASED ON USU 2007 INVENTORY

		Hydrologic Soil Group
112	Arizo	A
140	Casaga	C
192	Dalian-McCullough Complex	B
240	Goodsprings	D
300	Las Vegas	D
305	Las Vegas-DeStazo	D
314	Weiser-Wechech	B
540	Weiser	B
630	Badland	C
340	Zeheme-Rock	D
360	Rock Outcrop-St. Thomas	D
400	Tencee	D
155	Cave	D
840	Potosi-Zeheme-Rock	D

For undeveloped conditions, CNs were assigned to each soil type according to Table 2-2d in TR-55 (SCS, 1975). For developed conditions, CNs were reassigned to subbasins in the disposal area according to Table 2-2a in TR-55 (SCS, 1975). All soils outside the CTA boundary retained the same CN, reflecting no future land use changes. As previously mentioned, it was assumed that all development areas would be 65 percent residential, 20 percent streets and major roads, 10 percent commercial, and 5 percent parks and golf courses. Land use percentages represent a general trend in local development and were determined by studying several urban areas near the CTA study area.

2.2.3 LAG TIMES

Lag times were calculated for all basins according to methods outlined in CCRFCD's HCDDM. For basins less than one square mile in area, equation 2-2 was used.

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$$\textbf{Lag Time} = 0.6T_c \qquad (2\text{-}2)$$

$$T_c = T_i + T_t$$

$$T_i = \frac{1.8(1.1-K)L^{1/2}}{S^{1/3}}$$

$$K = 0.0132CN - 0.39$$

$$T_t = \frac{500}{60V_1} + \frac{(L-500)}{60V_2}$$

$$V_i = CS^{1/2}$$

Where:

T_c = Time of concentration (min)
T_i = Initial or overland flow time (min)
T_t = Travel time in ditch, channel, gutter, etc. (min)
K = Flow resistance coefficient
L = Length of overland flow, (ft, 500-ft maximum)
S = Average basin slope (%)

V_1 = Velocity for first 500 ft of channel (ft/s)
C = 20.2 for developed and 14.8 for undeveloped

V_2 = velocity for remaining section of channel (ft/s)
C = 30.6 for developed and 29.4 for undeveloped

For basin areas greater than one square mile, equation 2-3 was used according to the United States Bureau of Reclamation Method (USBR, 1989).

$$T_{Lag} = 20K_n\left[\frac{(L \times L_c)}{\sqrt{S}}\right]^{1/3} \qquad (2\text{-}3)$$

Where:

K_n = Manning's roughness factor for the basin channels
L = Length of longest watercourse (mi)
L_c = Length along longest watercourse measured upstream to a point opposite the centroid of the basin (mi)
S = Representative (average) slope of the longest watercourse (ft/ mi)

2.3 STREAMBANK EROSION

Several studies indicate streambank erosion is an important source of sediment in an urbanizing watershed like the ULVW watershed. In a similar sized watershed in southern California, two-thirds of the suspended sediment yield and

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downstream sedimentation was attributed to streambank (channelbank) erosion (Trimble, 1997). Also, in a rapidly urbanizing watershed in Washington state, Nelson and Booth (2002) concluded 20 percent of total watershed sediment yield was from streambank erosion with nearly 45 percent of course sediment in the watershed attributable to streambank erosion alone. Similarly, streambank erosion in the ULVW will be exacerbated by the higher frequency and volume of flood events resulting from increased imperviousness under the CTA alternatives with larger areas of land available for disposal.

HEC-RAS was first developed in 1995 to perform one-dimensional steady and unsteady flow river hydraulics and was recently expanded to include sediment transport mobile bed analysis. HEC-RAS is used primarily to quantify the change different land disposal alternatives would have on streambank erosion rates in the wash. To quantify changes in annual streambank erosion rates, the Meyer-Peter Müller (MPM) sediment transport routine was used in a HEC-RAS computational analysis of the ULVW. To simplify the analysis and focus on the sensitivity of the different land disposal alternatives, a representative cross-section was used for both the upstream and downstream reaches of the ULVW to provide numerical stability in the quasi-unsteady routing of the flood hydrograph. The 2-, 5-, 10-, 25-, 50-, and 100-yr hydrographs for each alternative were routed through both reaches to determine the amount of sediment loss occurring during specific events.

2.3.1 BASIS FOR COMPUTATIONAL ANALYSIS

Urbanization resulting from land disposal alternatives can indirectly increase channel erosion by increasing the frequency and volume of channel-altering storm flows (Leopold, 1968; Hammer, 1972). A literature review found no simple and accurate method of estimating streambank erosion in ephemeral washes. Therefore, to estimate the change in streambank erosion between the different land disposal alternatives, the sediment transport routines in HEC-RAS were employed to use sediment transport rates as a surrogate for streambank erosion. This method is adapted from CCRFCD's HCDDM for open channel flow and sediment loss analysis (1999). This method assumes the bed load transport rate will be equal to the transport capacity, indirectly accounting for streambank erosion.

The ephemeral nature and geologic conditions of the ULVW cause it to bifurcate and fan out into several divided flow channels, avoiding any single, well-defined

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channel in many areas. The wash is also subject to radical changes in shape, direction, depth, and flow carrying capacity during large storm events (CCRFCD, 1999). This makes it difficult to accurately analyze streambank erosion rates and it is important to understand a comparative analysis approach is thus appropriate.

Based on cross-section geometry data from VTN Nevada and CCRFCD, a representative wash cross-section with an approximate bottom width of 300 ft, a depth of 12 ft, and side slope of 4.5H:1V was judged to be appropriate. This cross-section was used along the entire length of the wash under analysis with the elevations and slopes from the VTN Nevada and CCRFCD data. The slope of the channel has a major influence on sediment transport rates and areas of aggradation and degradation and was therefore accurately represented.

For each land disposal alternative, the hydrographs for the 2-, 5-, 10-, 25-, 50-, and 100-yr storms from the HEC-1 rainfall-runoff models were routed through the channel using the MPM sediment transport routine. The MPM transport routine was selected based on physical and hydraulic characteristics of the ULVW including channel slope, flow velocity, and channel bed material grain size. The MPM routine is a bedload-only equation and does not account for suspended load. The MPM routine was therefore judged to be the most appropriate routine capable of producing a consistent analysis and meaningful results.

The sediment transport analysis determined general trends of aggradation and degradation in the wash and the sediment mass surplus or deficit at each cross-section. The surpluses and deficits were summed for each storm event, for each alternative and then statistically weighted to determine the average annual sediment loss from streambank erosion. For example, the average annual loss assumes 1/100th of the 100-yr loss, 1/50th of the 50-yr loss, 1/25th of the 25-yr loss, etc. All variables, except the flood hydrographs for the various events and alternatives, were kept constant throughout the analyses to maintain a consistent comparative approach.

2.3.2 SEDIMENT TRANSPORT

Several factors important in the sediment transport computational analysis include the sediment gradation, flow duration, computational time step, transport equation, boundary conditions, and movable bed station locations. These

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parameters were used to reflect actual physical processes in the wash while maintaining a large-scale, comparative approach.

Sediment gradations were taken from a geotechnical investigation (Kleinfelder, 1991) performed for the Upper Las Vegas Wash Detention Basin (Decatur Detention Basin). An average gradation was chosen from numerous boring and trench samples and was applied to the entire wash. Considering the comparative nature of this analysis and a lack of available channel bed gradation data along the study reach, it was considered appropriate to apply a single gradation to the entire length of the wash.

A five-minute time step with approximately one-minute computational intervals was used for all analyses. Because single storm events (hydrographs) were used in the analyses, it was important to keep short time steps to accurately represent changes in the flow. The computational interval was chosen to allow enough bed adjustments according to transport rates while maintaining an acceptable overall computation duration.

A 2,000-foot-long upstream and downstream buffer was included in all analyses to account for sediment and flow boundary aberrations. An equilibrium condition was used for upstream cross-sections so no initial aggradation or degradation could occur. A pass-through boundary was used for the downstream-most cross-section to restrict any aggradation or degradation. Moveable bed stations define the part of the streambed that can transport sediment during a flood event. The moveable bed stations are set at the overbank stations to allow sediment transport to occur under all wetted areas.

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3.0 ANALYSIS AND RESULTS

The following section further describes the methods outlined in Section 2 and summarizes the results of the analyses.

3.1 SURFACE EROSION

The runoff coefficients and TSS values outlined in Table 3.1 below were used in the surface erosion analysis.

TABLE 3.1
RUNOFF COEFFICIENTS AND TSS VALUES CALIBRATED FOR THE LAS VEGAS VALLEY[1]

		TSS (mg/l)
Residential	0.05	120
Streets and Major Roads	0.11	1,200
Commercial	0.11	80
Parks and Golf Courses	0.01	130
Undeveloped/Desert	0.01	4,800

[1]Runoff Coefficients and TSS values taken from Reginato and Piechota (2004).

All disposal land under each alternative assumes future development being 65 percent residential, 20 percent streets and major roads, 10 percent commercial, and 5 percent parks and golf courses. All non-disposal land assumes no future development and is considered 97 percent desert/undeveloped and 3 percent streets and major roads. Average monthly rainfall depths as of December 31st, 2007 from CCRFCD's website were used in the analysis and are provided in Table 3.2 below.

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TABLE 3.2
AVERAGE MONTHLY RAINFALL DEPTHS FOR CLARK COUNTY, NV[2]

	Rainfall Depth (in)
January	0.59
February	0.69
March	0.59
April	0.15
May	0.24
June	0.08
July	0.44
August	0.45
September	0.31
October	0.24
November	0.31
December	0.40
Annual	4.49

[2]Rainfall depths take from: http://www.ccrfcd.org/raingauges.htm

Table 3.3 shows, by land disposal alternative, the amount of land disposal and the resulting sediment loss rate. Full calculations for monthly sediment loads by land use for each alternative are provided in Appendix A.

TABLE 3.3
LAND DISPOSAL ALTERNATIVE AREAS AND ANNUAL SURFACE EROSION RATES

				Percent Decrease from Baseline
Baseline	0.00E+00	2.88E+05	2.88E+05	0
Alternative A	1.07E+04	2.71E+05	2.81E+05	2
Alternative B	3.50E+04	2.31E+05	2.66E+05	8
Alternative C	9.57E+04	1.33E+05	2.28E+05	21
Alternative D	1.09E+05	1.11E+05	2.20E+05	24
Alternative E	1.35E+05	6.94E+04	2.04E+05	29
No-Action Alternative	1.59E+05	2.93E+04	1.88E+05	35

3.2 HYDROLOGY

The CN and lag time calculations are included in Appendix B. Abbreviated HEC-1 output is included in Appendix C.

The peak flows for the 100-yr flood event of each alternative are provided in Table 3.4 below. The peak flows for the entire subbasin network upstream and

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downstream of the ULVW Detention Basin were used in the analyses to reflect the most extreme flow conditions in the wash.

TABLE 3.4
100-YR STORM AND ALTERNATIVE SPECIFIC PEAK FLOWS FOR REACHES UPSTREAM (U/S) AND DOWNSTREAM (D/S) OF THE DECATUR DETENTION BASIN

			se from Baseline	
				D/S
Baseline	13,750	9,670	0	0
Alternative A	13,790	9,690	0	0
Alternative B	14,840	9,760	8	1
Alternative C	15,960	10,170	16	5
Alternative D	16,490	10,210	20	6
Alternative E	16,720	10,460	22	8
No-Action Alternative	17,130	11,270	25	17

3.3 STREAMBANK EROSION

Streambank erosion rates were determined by summing all cross-sectional sediment deficits or surpluses and then statistically weighting the event to determine an annual average sediment loss. Table 3.5 shows the average annual sediment loss from streambank erosion for the upstream and downstream reaches of the ULVW. A complete table of streambank erosion loss rates according to specific storm events is included in Appendix D.

TABLE 3.5
AVERAGE ANNUAL SEDIMENT LOSSES FROM STREAMBANK EROSION IN THE ULVW

	Annual Sedim (kg/yr)			Percent Increase from Baseline
Baseline	6.07E+05	3.01E+05	9.08E+05	0
Alternative A	6.20E+05	3.11E+05	9.31E+05	3
Alternative B	6.93E+05	3.49E+05	1.04E+06	15
Alternative C	8.08E+05	4.47E+05	1.25E+06	38
Alternative D	8.54E+05	4.73E+05	1.33E+06	46
Alternative E	8.97E+05	5.13E+05	1.41E+06	55
No-Action Alternative	9.73E+05	5.49E+05	1.52E+06	68

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Urbanization as a result of land disposal will indirectly cause more sediment loss in the CTA study area. The results from the Simple Method show residential and commercial land development will decrease surface erosion because more impervious surfaces, such as parking lots and rooftops, will cover previously exposed soil. Landscaping practices associated with urbanization would also reduce surface erosion. However, assuming no change to the existing flood control infrastructure, more impervious surfaces will also increase flows in the ULVW resulting in higher streambank erosion rates. Ultimately, increased land development will cause more sediment loss in the CTA study area. Table 4.1 below shows the total sediment loss in the CTA study area for each land disposal alternative.

TABLE 4.1
TOTAL SEDIMENT LOSS IN THE CTA STUDY AREA FOR EACH LAND DISPOSAL ALTERNATIVE

				Percent Increase from Baseline
Baseline	9.08E+05	2.88E+05	1.20E+06	0
Alternative A	9.31E+05	2.81E+05	1.21E+06	1
Alternative B	1.04E+06	2.66E+05	1.31E+06	9
Alternative C	1.25E+06	2.28E+05	1.48E+06	24
Alternative D	1.33E+06	2.20E+05	1.55E+06	29
Alternative E	1.41E+06	2.04E+05	1.61E+06	35
No-Action Alternative	1.52E+06	1.88E+05	1.71E+06	43

Given the complexity of the hydrologic and erosive mechanisms at work in the CTA study area and the simplifying assumptions made in the analyses, the results presented are comparative and should be considered qualitatively. Perhaps the most useful estimates of land disposal alternative impacts on hydrology and erosion are shown by the increases from baseline (existing) conditions. Alternative A disposes of the least amount of land and has the smallest sediment loss increase at 1 percent. The No-Action Alternative disposes of the largest amount of land and has the largest sediment loss increase at 43 percent.

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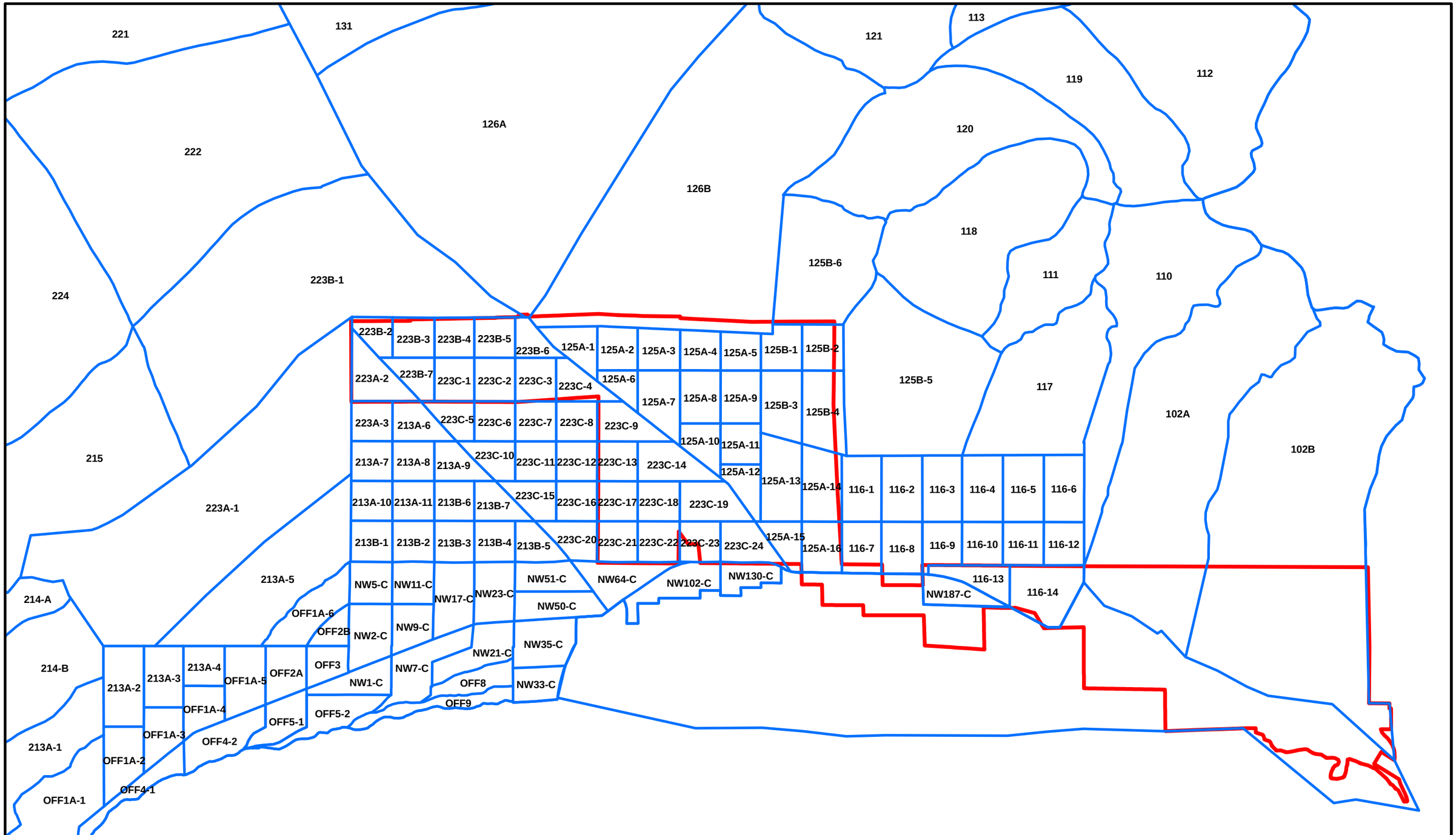
Figure 1

ULVW WATERSHED WITH CONTRIBUTING SUBBASINS



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Legend

- CTA Study Area
- Basins

0 6,000 12,000 Feet

1 inch equals 6,000 feet

N

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FILE NAME:	ULVW Hydro.mxd

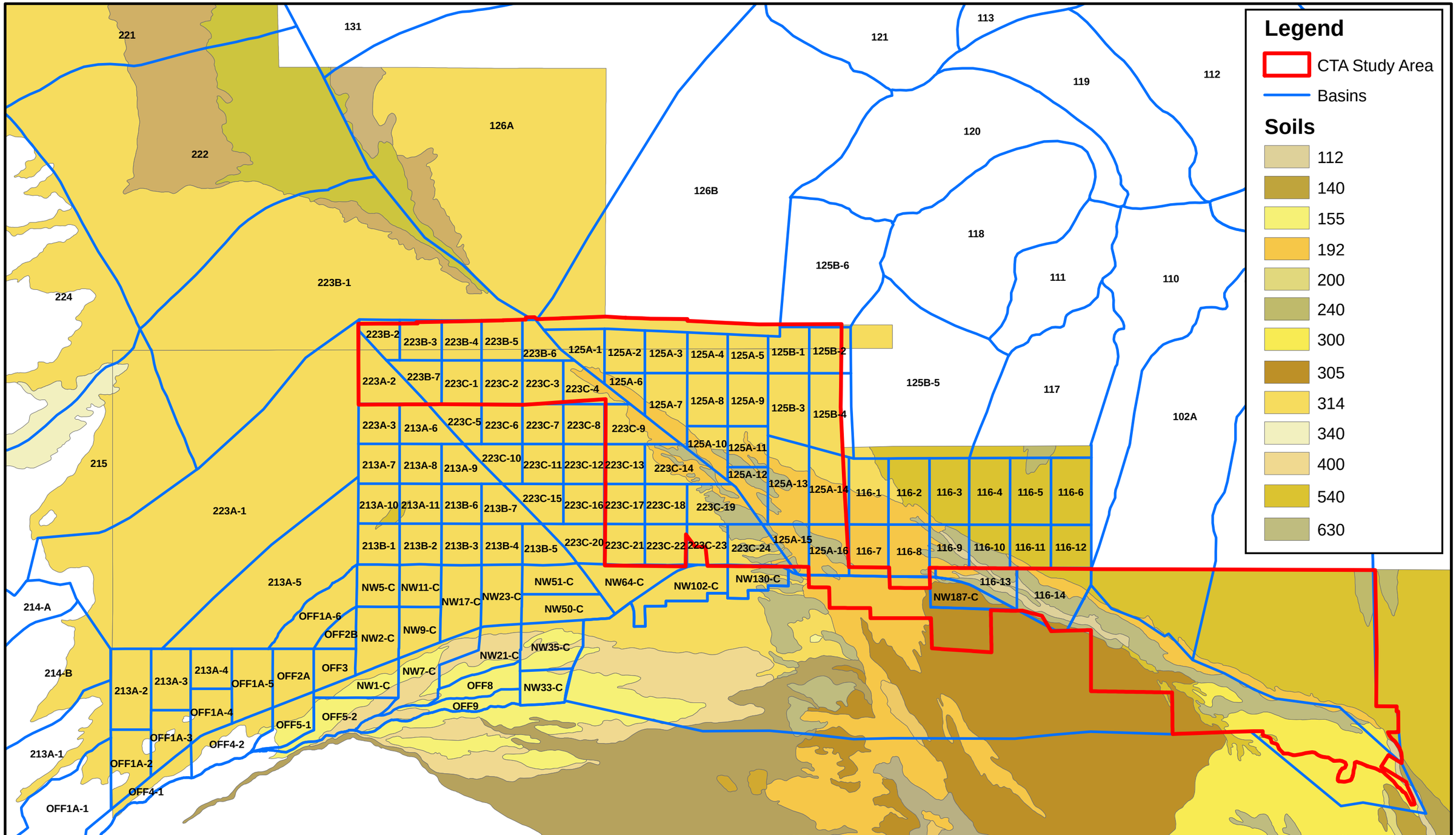
UPPER LAS VEGAS WASH
CTA STUDY AREA SUBBASIN MAP

UPPER LAS VEGAS WASH SEIS
CLARK COUNTY, NV

FIGURE
1

Figure 2

SOIL TYPE MAP FOR ULVW WATERSHED



0 6,200 12,400 Feet

1 inch equals 6,000 feet

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UPPER LAS VEGAS WASH
CTA STUDY AREA SOIL AND SUBBASIN MAP

UPPER LAS VEGAS WASH SEIS
CLARK COUNTY, NV
SOURCE: UTAH STATE SOIL SURVEY, 2008

FIGURE
2

APPENDIX A
DELTAILED SURFACE EROSION CALCULATION SHEETS AND CHARTS

Baseline Alternative

CTA Study Area =	13623	ac
Non Disp. Area =	13623	ac
Disposal Area =	0	ac
Sediment Load =	2.86E+05	kg/yr

Month	Annual Rainfall	COM Area (%) = 10		IND Area (%) = 0		PAR Area (%) = 5		PUB Area (%) = 0		RES Area (%) = 65		ROA Area (%) = 20		UND Area (%) = 0		Disposal Yield	Non-Disposal[1] Yield	Monthly Yield x 10^3	Cumulative Yield x 10^3
	P_{MON} (in)	R_{COM} (ac-ft)	Y_{COM} (kg/mo)	R_{IND} (ac-ft)	Y_{IND} (kg/mo)	R_{PAR} (ac-ft)	Y_{PAR} (kg/mo)	R_{PUB} (ac-ft)	Y_{PUB} (kg/mo)	R_{RES} (ac-ft)	Y_{RES} (kg/mo)	R_{ROA} (ac-ft)	Y_{ROA} (kg/mo)	R_{UND} (ac-ft)	Y_{UND} (kg/mo)	Y_{DIS} (kg/mo)	Y_{NDIS} (kg/mo)	Y_{MON} (kg/mo)	Y_{CUMM} (kg/mo)
JAN	0.59	0.0	0.00E+00	0.0	0.00E+00	0.0	0.00E+00	0.0	0.00E+00	0.0	0.00E+00	0.0	0.00E+00	0.0	0.00E+00	0.00E+00	3.75E+04	37	37
FEB	0.69	0.0	0.00E+00	0.0	0.00E+00	0.0	0.00E+00	0.0	0.00E+00	0.0	0.00E+00	0.0	0.00E+00	0.0	0.00E+00	0.00E+00	4.38E+04	44	81
MAR	0.59	0.0	0.00E+00	0.0	0.00E+00	0.0	0.00E+00	0.0	0.00E+00	0.0	0.00E+00	0.0	0.00E+00	0.0	0.00E+00	0.00E+00	3.75E+04	37	119
APR	0.15	0.0	0.00E+00	0.0	0.00E+00	0.0	0.00E+00	0.0	0.00E+00	0.0	0.00E+00	0.0	0.00E+00	0.0	0.00E+00	0.00E+00	9.52E+03	10	128
MAY	0.24	0.0	0.00E+00	0.0	0.00E+00	0.0	0.00E+00	0.0	0.00E+00	0.0	0.00E+00	0.0	0.00E+00	0.0	0.00E+00	0.00E+00	1.52E+04	15	143
JUN	0.08	0.0	0.00E+00	0.0	0.00E+00	0.0	0.00E+00	0.0	0.00E+00	0.0	0.00E+00	0.0	0.00E+00	0.0	0.00E+00	0.00E+00	5.08E+03	5	149
JUL	0.44	0.0	0.00E+00	0.0	0.00E+00	0.0	0.00E+00	0.0	0.00E+00	0.0	0.00E+00	0.0	0.00E+00	0.0	0.00E+00	0.00E+00	2.79E+04	28	177
AUG	0.45	0.0	0.00E+00	0.0	0.00E+00	0.0	0.00E+00	0.0	0.00E+00	0.0	0.00E+00	0.0	0.00E+00	0.0	0.00E+00	0.00E+00	2.86E+04	29	205
SEP	0.31	0.0	0.00E+00	0.0	0.00E+00	0.0	0.00E+00	0.0	0.00E+00	0.0	0.00E+00	0.0	0.00E+00	0.0	0.00E+00	0.00E+00	1.97E+04	20	225
OCT	0.24	0.0	0.00E+00	0.0	0.00E+00	0.0	0.00E+00	0.0	0.00E+00	0.0	0.00E+00	0.0	0.00E+00	0.0	0.00E+00	0.00E+00	1.52E+04	15	240
NOV	0.31	0.0	0.00E+00	0.0	0.00E+00	0.0	0.00E+00	0.0	0.00E+00	0.0	0.00E+00	0.0	0.00E+00	0.0	0.00E+00	0.00E+00	1.97E+04	20	260
DEC	0.40	0.0	0.00E+00	0.0	0.00E+00	0.0	0.00E+00	0.0	0.00E+00	0.0	0.00E+00	0.0	0.00E+00	0.0	0.00E+00	0.00E+00	2.54E+04	25	285
Total =	4.49	0.0	0.00E+00	0.0	0.00E+00	0.0	0.00E+00	0.0	0.00E+00	0.0	0.00E+00	0.0	0.00E+00	0.0	0.00E+00	0.00E+00	2.86E+05		

[1]Non-Disposal areas considered 97% undeveloped and 3% roads

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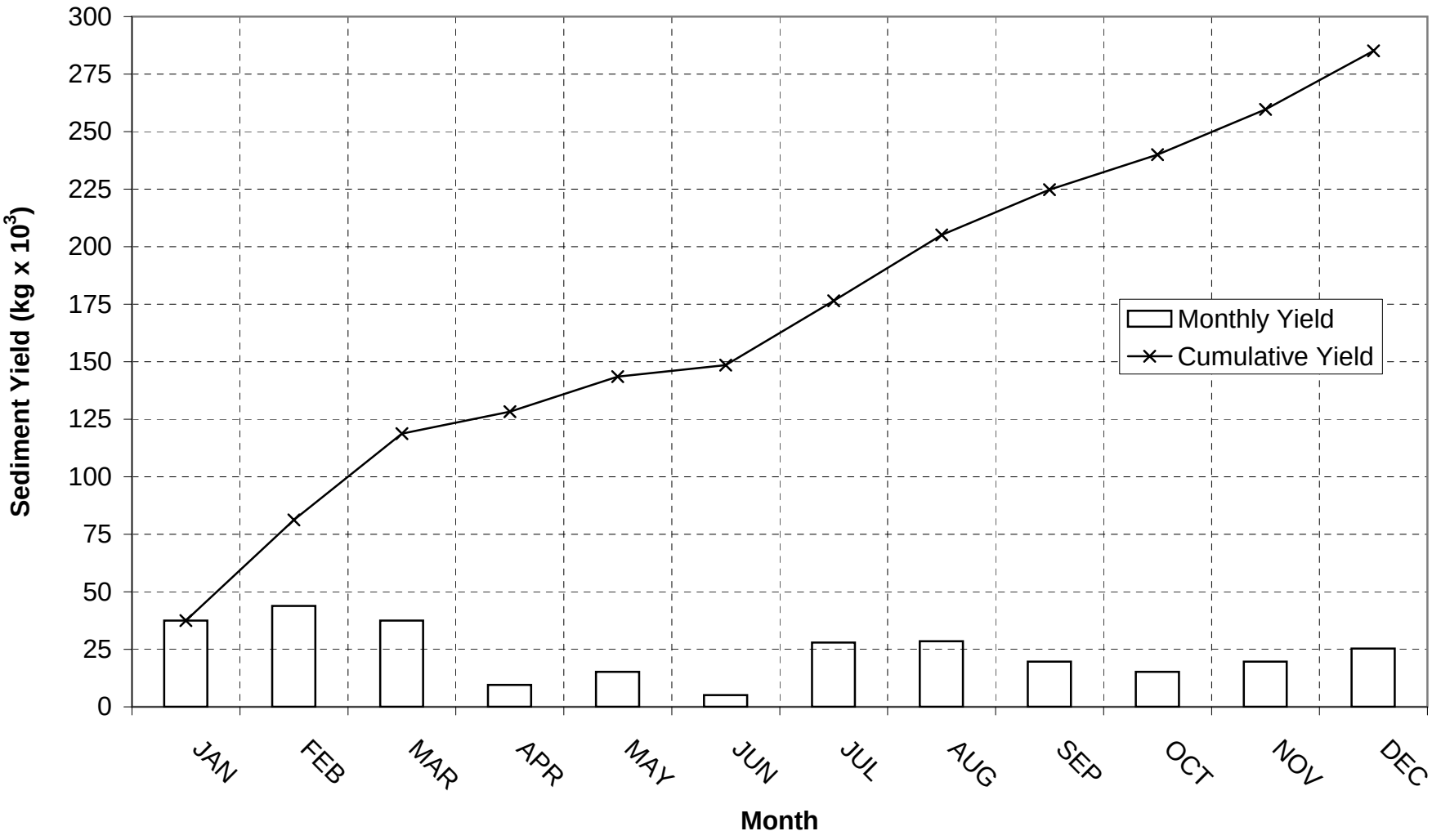

Monthly and cumulative surface erosion sediment yields from Baseline Alternative. Average monthly rainfall depths and predicted land use types were used in the Simple Method for average monthly yield calculations.

Alternative A

CTA Study Area =	13623 ac
Non Disp. Area =	13252 ac
Disposal Area =	371 ac
Sediment Load =	2.83E+05 kg/yr

Month	Annual Rainfall	COM Area (%) = 10		IND Area (%) = 0		PAR Area (%) = 5		PUB Area (%) = 0		RES Area (%) = 65		ROA Area (%) = 20		UND Area (%) = 0		Disposal Yield	Non-Disposal[1] Yield	Monthly Yield x 10^3	Cumulative Yield x 10^3
	P_{MON} (in)	R_{COM} (ac-ft)	Y_{COM} (kg/mo)	R_{IND} (ac-ft)	Y_{IND} (kg/mo)	R_{PAR} (ac-ft)	Y_{PAR} (kg/mo)	R_{PUB} (ac-ft)	Y_{PUB} (kg/mo)	R_{RES} (ac-ft)	Y_{RES} (kg/mo)	R_{ROA} (ac-ft)	Y_{ROA} (kg/mo)	R_{UND} (ac-ft)	Y_{UND} (kg/mo)	Y_{DIS} (kg/mo)	Y_{NDIS} (kg/mo)	Y_{MON} (kg/mo)	Y_{CUMM} (kg/mo)
JAN	0.59	0.2	1.78E+01	0.0	0.00E+00	0.0	1.31E+00	0.0	0.00E+00	0.5	7.88E+01	0.4	5.33E+02	0.0	0.00E+00	6.31E+02	3.64E+04	37	37
FEB	0.69	0.2	2.08E+01	0.0	0.00E+00	0.0	1.53E+00	0.0	0.00E+00	0.6	9.21E+01	0.4	6.23E+02	0.0	0.00E+00	7.38E+02	4.26E+04	43	80
MAR	0.59	0.2	1.78E+01	0.0	0.00E+00	0.0	1.31E+00	0.0	0.00E+00	0.5	7.88E+01	0.4	5.33E+02	0.0	0.00E+00	6.31E+02	3.64E+04	37	117
APR	0.15	0.0	4.52E+00	0.0	0.00E+00	0.0	3.34E-01	0.0	0.00E+00	0.1	2.00E+01	0.1	1.36E+02	0.0	0.00E+00	1.60E+02	9.26E+03	9	127
MAY	0.24	0.1	7.23E+00	0.0	0.00E+00	0.0	5.34E-01	0.0	0.00E+00	0.2	3.20E+01	0.1	2.17E+02	0.0	0.00E+00	2.57E+02	1.48E+04	15	142
JUN	0.08	0.0	2.41E+00	0.0	0.00E+00	0.0	1.78E-01	0.0	0.00E+00	0.1	1.07E+01	0.0	7.23E+01	0.0	0.00E+00	8.55E+01	4.94E+03	5	147
JUL	0.44	0.1	1.33E+01	0.0	0.00E+00	0.0	9.79E-01	0.0	0.00E+00	0.4	5.87E+01	0.3	3.98E+02	0.0	0.00E+00	4.71E+02	2.72E+04	28	175
AUG	0.45	0.1	1.36E+01	0.0	0.00E+00	0.0	1.00E+00	0.0	0.00E+00	0.4	6.01E+01	0.3	4.07E+02	0.0	0.00E+00	4.81E+02	2.78E+04	28	203
SEP	0.31	0.1	9.34E+00	0.0	0.00E+00	0.0	6.90E-01	0.0	0.00E+00	0.3	4.14E+01	0.2	2.80E+02	0.0	0.00E+00	3.31E+02	1.91E+04	19	222
OCT	0.24	0.1	7.23E+00	0.0	0.00E+00	0.0	5.34E-01	0.0	0.00E+00	0.2	3.20E+01	0.1	2.17E+02	0.0	0.00E+00	2.57E+02	1.48E+04	15	237
NOV	0.31	0.1	9.34E+00	0.0	0.00E+00	0.0	6.90E-01	0.0	0.00E+00	0.3	4.14E+01	0.2	2.80E+02	0.0	0.00E+00	3.31E+02	1.91E+04	19	257
DEC	0.40	0.1	1.20E+01	0.0	0.00E+00	0.0	8.90E-01	0.0	0.00E+00	0.4	5.34E+01	0.2	3.61E+02	0.0	0.00E+00	4.28E+02	2.47E+04	25	282
Total =	4.49	1.4	1.35E+02	0.0	0.00E+00	0.1	9.99E+00	0.0	0.00E+00	4.1	5.99E+02	2.7	4.06E+03	0.0	0.00E+00	4.80E+03	2.78E+05		

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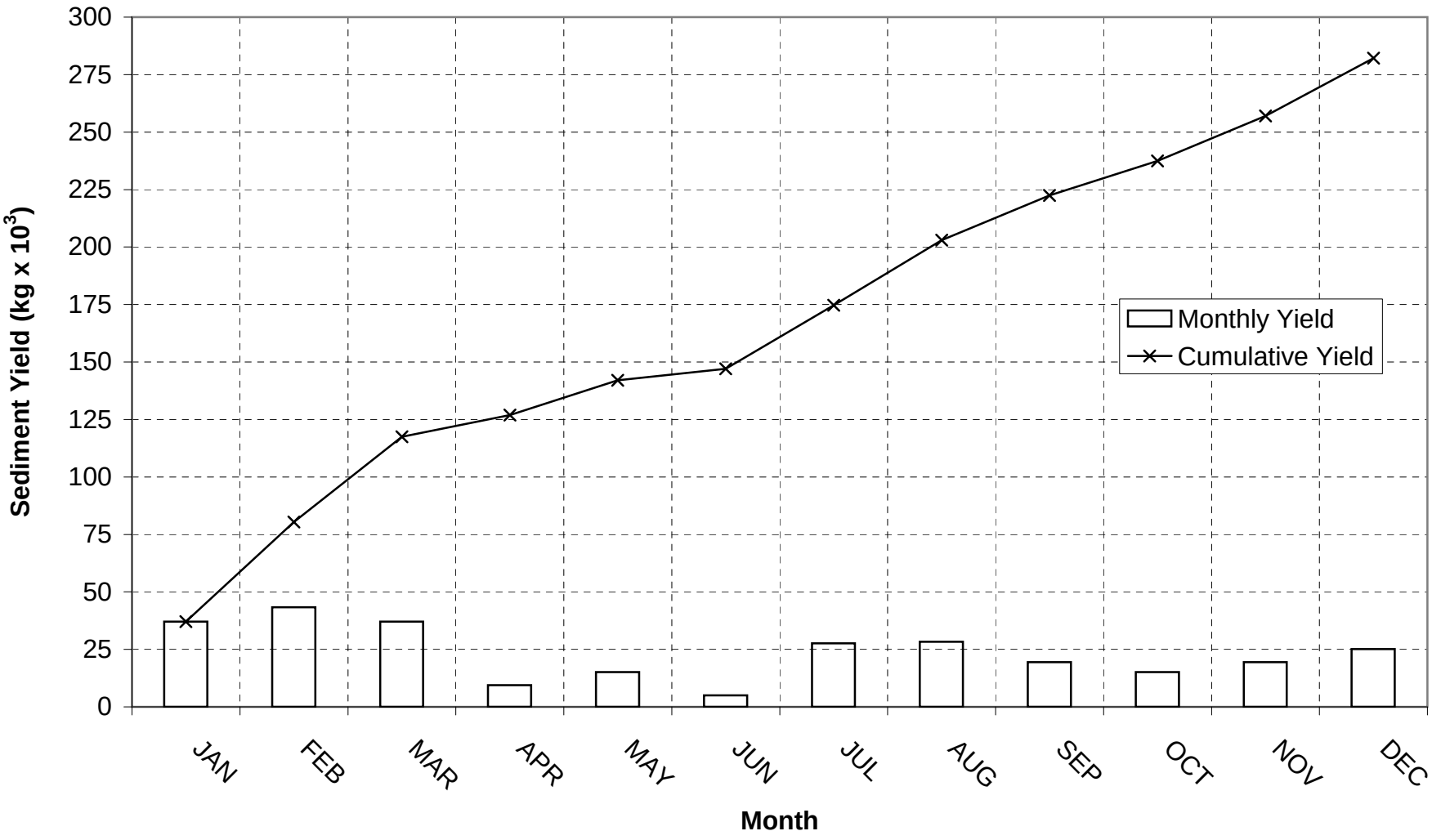

Monthly and cumulative surface erosion sediment yields from Alternative A. Average monthly rainfall depths and predicted land use types were used in the Simple Method for average monthly yield calculations.

Alternative B

CTA Study Area =	13623 ac
Non Disp. Area =	11307 ac
Disposal Area =	2316 ac
Sediment Load =	2.67E+05 kg/yr

Month	Annual Rainfall	COM Area (%) = 10		IND Area (%) = 0		PAR Area (%) = 5		PUB Area (%) = 0		RES Area (%) = 65		ROA Area (%) = 20		UND Area (%) = 0		Disposal Yield	Non-Disposal[1] Yield	Monthly Yield x 10^3	Cumulative Yield x 10^3
	P_{MON} (in)	R_{COM} (ac-ft)	Y_{COM} (kg/mo)	R_{IND} (ac-ft)	Y_{IND} (kg/mo)	R_{PAR} (ac-ft)	Y_{PAR} (kg/mo)	R_{PUB} (ac-ft)	Y_{PUB} (kg/mo)	R_{RES} (ac-ft)	Y_{RES} (kg/mo)	R_{ROA} (ac-ft)	Y_{ROA} (kg/mo)	R_{UND} (ac-ft)	Y_{UND} (kg/mo)	Y_{DIS} (kg/mo)	Y_{NDIS} (kg/mo)	Y_{MON} (kg/mo)	Y_{CUMM} (kg/mo)
JAN	0.59	1.1	1.11E+02	0.0	0.00E+00	0.1	8.19E+00	0.0	0.00E+00	3.3	4.92E+02	2.3	3.33E+03	0.0	0.00E+00	3.94E+03	3.11E+04	35	35
FEB	0.69	1.3	1.30E+02	0.0	0.00E+00	0.1	9.58E+00	0.0	0.00E+00	3.9	5.75E+02	2.6	3.89E+03	0.0	0.00E+00	4.61E+03	3.64E+04	41	76
MAR	0.59	1.1	1.11E+02	0.0	0.00E+00	0.1	8.19E+00	0.0	0.00E+00	3.3	4.92E+02	2.3	3.33E+03	0.0	0.00E+00	3.94E+03	3.11E+04	35	111
APR	0.15	0.3	2.82E+01	0.0	0.00E+00	0.0	2.08E+00	0.0	0.00E+00	0.8	1.25E+02	0.6	8.46E+02	0.0	0.00E+00	1.00E+03	7.90E+03	9	120
MAY	0.24	0.5	4.51E+01	0.0	0.00E+00	0.0	3.33E+00	0.0	0.00E+00	1.4	2.00E+02	0.9	1.35E+03	0.0	0.00E+00	1.60E+03	1.26E+04	14	134
JUN	0.08	0.2	1.50E+01	0.0	0.00E+00	0.0	1.11E+00	0.0	0.00E+00	0.5	6.67E+01	0.3	4.51E+02	0.0	0.00E+00	5.34E+02	4.22E+03	5	139
JUL	0.44	0.8	8.27E+01	0.0	0.00E+00	0.0	6.11E+00	0.0	0.00E+00	2.5	3.67E+02	1.7	2.48E+03	0.0	0.00E+00	2.94E+03	2.32E+04	26	165
AUG	0.45	0.9	8.46E+01	0.0	0.00E+00	0.0	6.25E+00	0.0	0.00E+00	2.5	3.75E+02	1.7	2.54E+03	0.0	0.00E+00	3.00E+03	2.37E+04	27	192
SEP	0.31	0.6	5.83E+01	0.0	0.00E+00	0.0	4.31E+00	0.0	0.00E+00	1.8	2.58E+02	1.2	1.75E+03	0.0	0.00E+00	2.07E+03	1.63E+04	18	210
OCT	0.24	0.5	4.51E+01	0.0	0.00E+00	0.0	3.33E+00	0.0	0.00E+00	1.4	2.00E+02	0.9	1.35E+03	0.0	0.00E+00	1.60E+03	1.26E+04	14	224
NOV	0.31	0.6	5.83E+01	0.0	0.00E+00	0.0	4.31E+00	0.0	0.00E+00	1.8	2.58E+02	1.2	1.75E+03	0.0	0.00E+00	2.07E+03	1.63E+04	18	243
DEC	0.40	0.8	7.52E+01	0.0	0.00E+00	0.0	5.55E+00	0.0	0.00E+00	2.3	3.33E+02	1.5	2.26E+03	0.0	0.00E+00	2.67E+03	2.11E+04	24	267
Total =	4.49	8.6	8.44E+02	0.0	0.00E+00	0.4	6.24E+01	0.0	0.00E+00	25.3	3.74E+03	17.2	2.53E+04	0.0	0.00E+00	3.00E+04	2.37E+05		

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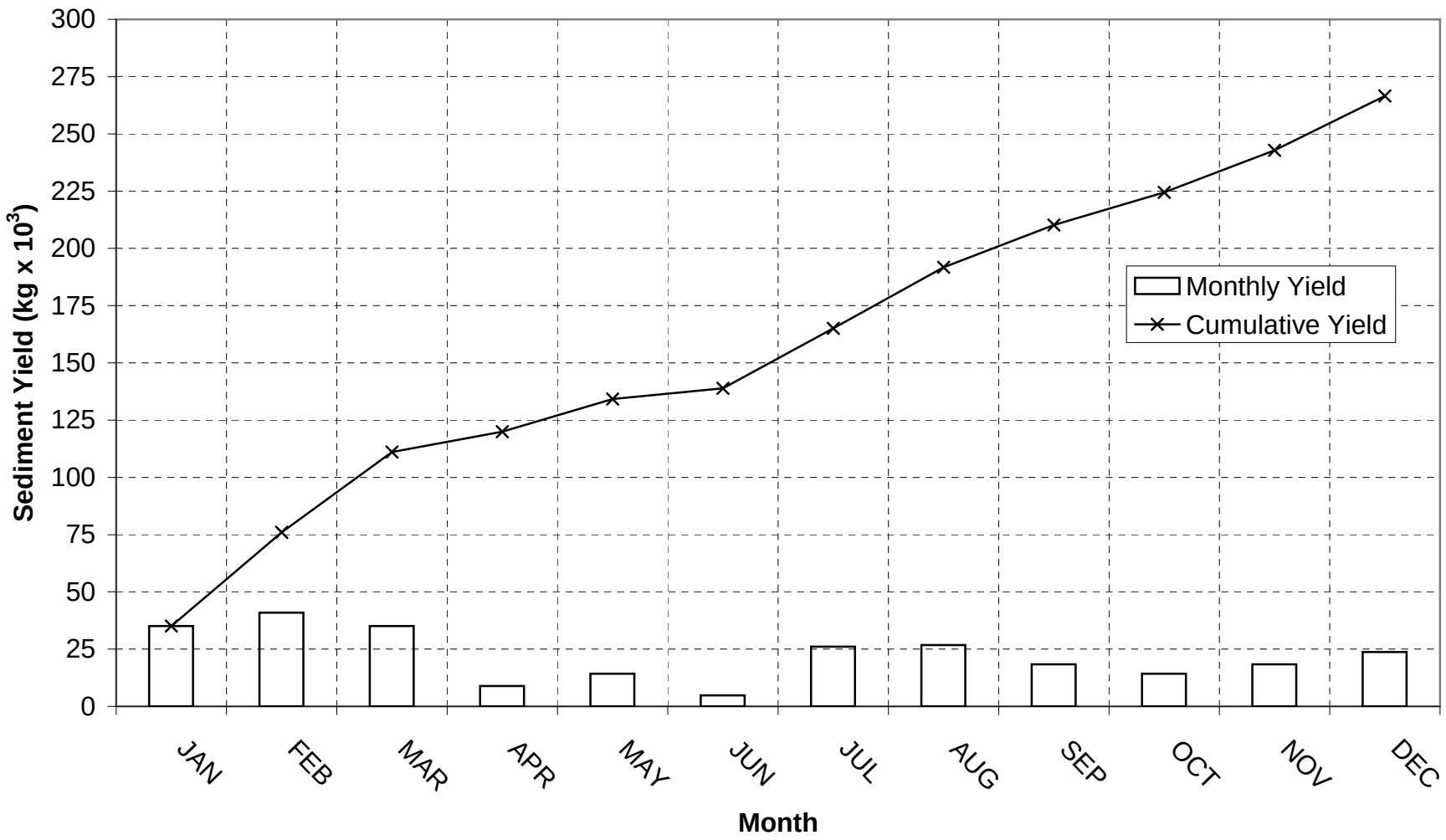

Monthly and cumulative surface erosion sediment yields from Alternative B. Average monthly rainfall depths and predicted land use types were used in the Simple Method for average monthly yield calculations.

Alternative C

CTA Study Area =	13623 ac
Non Disp. Area =	6662 ac
Disposal Area =	6961 ac
Sediment Load =	2.30E+05 kg/yr

Month	Annual Rainfall	COM Area (%) = 10		IND Area (%) = 0		PAR Area (%) = 5		PUB Area (%) = 0		RES Area (%) = 65		ROA Area (%) = 20		UND Area (%) = 0		Disposal Yield	Non-Disposal[1] Yield	Monthly Yield x 10^3	Cumulative Yield x 10^3
	P_{MON} (in)	R_{COM} (ac-ft)	Y_{COM} (kg/mo)	R_{IND} (ac-ft)	Y_{IND} (kg/mo)	R_{PAR} (ac-ft)	Y_{PAR} (kg/mo)	R_{PUB} (ac-ft)	Y_{PUB} (kg/mo)	R_{RES} (ac-ft)	Y_{RES} (kg/mo)	R_{ROA} (ac-ft)	Y_{ROA} (kg/mo)	R_{UND} (ac-ft)	Y_{UND} (kg/mo)	Y_{DIS} (kg/mo)	Y_{NDIS} (kg/mo)	Y_{MON} (kg/mo)	Y_{CUMM} (kg/mo)
JAN	0.59	3.4	3.33E+02	0.0	0.00E+00	0.2	2.46E+01	0.0	0.00E+00	10.0	1.48E+03	6.8	1.00E+04	0.0	0.00E+00	1.18E+04	1.83E+04	30	30
FEB	0.69	4.0	3.90E+02	0.0	0.00E+00	0.2	2.88E+01	0.0	0.00E+00	11.7	1.73E+03	7.9	1.17E+04	0.0	0.00E+00	1.38E+04	2.14E+04	35	65
MAR	0.59	3.4	3.33E+02	0.0	0.00E+00	0.2	2.46E+01	0.0	0.00E+00	10.0	1.48E+03	6.8	1.00E+04	0.0	0.00E+00	1.18E+04	1.83E+04	30	96
APR	0.15	0.9	8.48E+01	0.0	0.00E+00	0.0	6.26E+00	0.0	0.00E+00	2.5	3.76E+02	1.7	2.54E+03	0.0	0.00E+00	3.01E+03	4.66E+03	8	103
MAY	0.24	1.4	1.36E+02	0.0	0.00E+00	0.1	1.00E+01	0.0	0.00E+00	4.1	6.01E+02	2.8	4.07E+03	0.0	0.00E+00	4.82E+03	7.45E+03	12	116
JUN	0.08	0.5	4.52E+01	0.0	0.00E+00	0.0	3.34E+00	0.0	0.00E+00	1.4	2.00E+02	0.9	1.36E+03	0.0	0.00E+00	1.61E+03	2.48E+03	4	120
JUL	0.44	2.5	2.49E+02	0.0	0.00E+00	0.1	1.84E+01	0.0	0.00E+00	7.5	1.10E+03	5.1	7.46E+03	0.0	0.00E+00	8.83E+03	1.37E+04	22	142
AUG	0.45	2.6	2.54E+02	0.0	0.00E+00	0.1	1.88E+01	0.0	0.00E+00	7.6	1.13E+03	5.2	7.63E+03	0.0	0.00E+00	9.03E+03	1.40E+04	23	165
SEP	0.31	1.8	1.75E+02	0.0	0.00E+00	0.1	1.29E+01	0.0	0.00E+00	5.3	7.76E+02	3.6	5.26E+03	0.0	0.00E+00	6.22E+03	9.62E+03	16	181
OCT	0.24	1.4	1.36E+02	0.0	0.00E+00	0.1	1.00E+01	0.0	0.00E+00	4.1	6.01E+02	2.8	4.07E+03	0.0	0.00E+00	4.82E+03	7.45E+03	12	193
NOV	0.31	1.8	1.75E+02	0.0	0.00E+00	0.1	1.29E+01	0.0	0.00E+00	5.3	7.76E+02	3.6	5.26E+03	0.0	0.00E+00	6.22E+03	9.62E+03	16	209
DEC	0.40	2.3	2.26E+02	0.0	0.00E+00	0.1	1.67E+01	0.0	0.00E+00	6.8	1.00E+03	4.6	6.78E+03	0.0	0.00E+00	8.03E+03	1.24E+04	20	229
Total =	4.49	25.8	2.54E+03	0.0	0.00E+00	1.2	1.87E+02	0.0	0.00E+00	76.2	1.12E+04	51.6	7.61E+04	0.0	0.00E+00	9.01E+04	1.40E+05		

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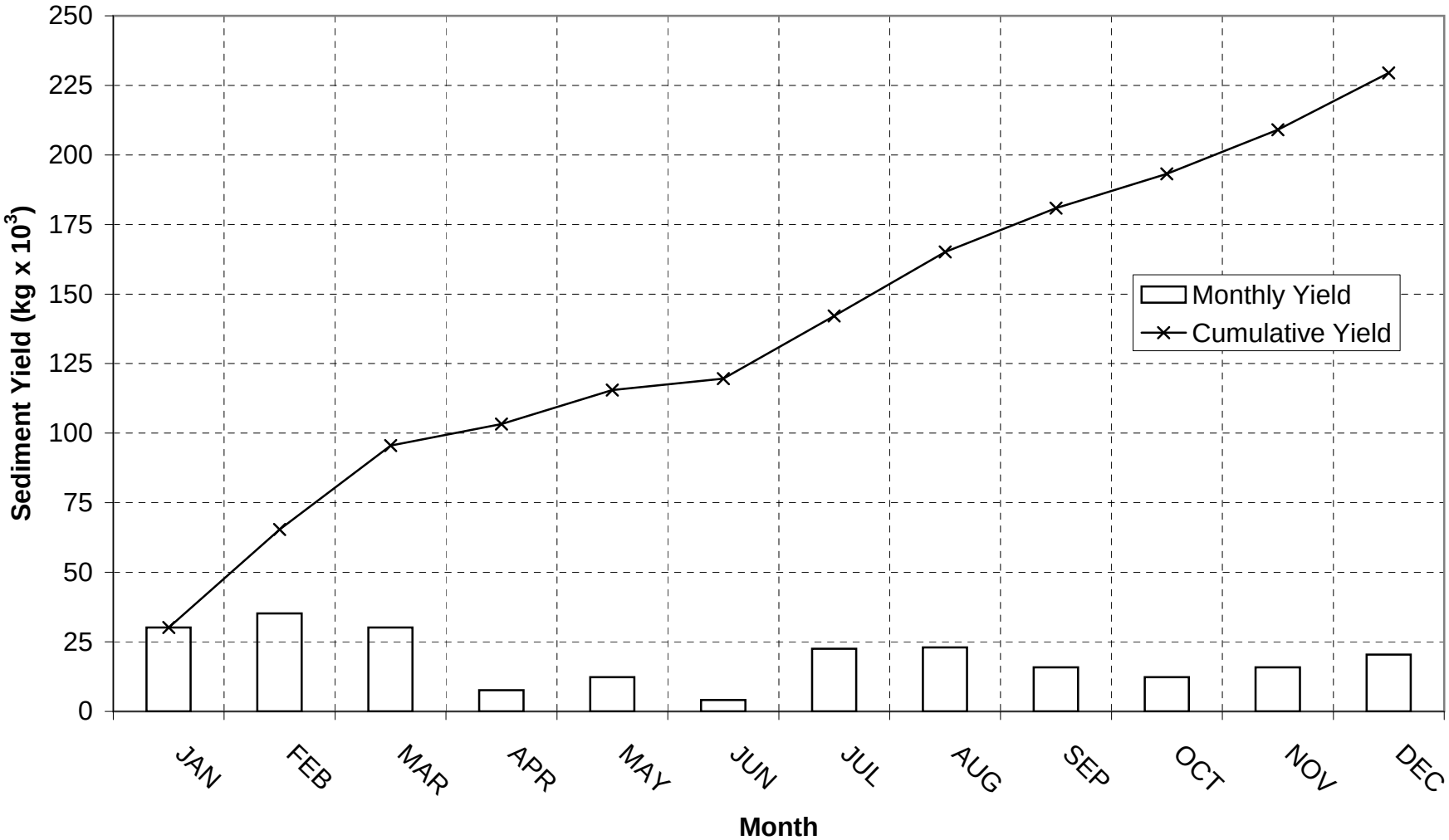

Monthly and cumulative surface erosion sediment yields from Alternative C. Average monthly rainfall depths and predicted land use types were used in the Simple Method for average monthly yield calculations.

Alternative D

CTA Study Area =	13623 ac
Non Disp. Area =	5600 ac
Disposal Area =	8023 ac
Sediment Load =	2.21E+05 kg/yr

Month	Annual Rainfall	COM Area (%) = 10		IND Area (%) = 0		PAR Area (%) = 5		PUB Area (%) = 0		RES Area (%) = 65		ROA Area (%) = 20		UND Area (%) = 0		Disposal Yield	Non-Disposal[1] Yield	Monthly Yield x 10^3	Cumulative Yield x 10^3
	P_{MON} (in)	R_{COM} (ac-ft)	Y_{COM} (kg/mo)	R_{IND} (ac-ft)	Y_{IND} (kg/mo)	R_{PAR} (ac-ft)	Y_{PAR} (kg/mo)	R_{PUB} (ac-ft)	Y_{PUB} (kg/mo)	R_{RES} (ac-ft)	Y_{RES} (kg/mo)	R_{ROA} (ac-ft)	Y_{ROA} (kg/mo)	R_{UND} (ac-ft)	Y_{UND} (kg/mo)	Y_{DIS} (kg/mo)	Y_{NDIS} (kg/mo)	Y_{MON} (kg/mo)	Y_{CUMM} (kg/mo)
JAN	0.59	3.9	3.84E+02	0.0	0.00E+00	0.2	2.84E+01	0.0	0.00E+00	11.5	1.70E+03	7.8	1.15E+04	0.0	0.00E+00	1.36E+04	1.54E+04	29	29
FEB	0.69	4.6	4.49E+02	0.0	0.00E+00	0.2	3.32E+01	0.0	0.00E+00	13.5	1.99E+03	9.1	1.35E+04	0.0	0.00E+00	1.60E+04	1.80E+04	34	63
MAR	0.59	3.9	3.84E+02	0.0	0.00E+00	0.2	2.84E+01	0.0	0.00E+00	11.5	1.70E+03	7.8	1.15E+04	0.0	0.00E+00	1.36E+04	1.54E+04	29	92
APR	0.15	1.0	9.77E+01	0.0	0.00E+00	0.0	7.22E+00	0.0	0.00E+00	2.9	4.33E+02	2.0	2.93E+03	0.0	0.00E+00	3.47E+03	3.91E+03	7	99
MAY	0.24	1.6	1.56E+02	0.0	0.00E+00	0.1	1.15E+01	0.0	0.00E+00	4.7	6.93E+02	3.2	4.69E+03	0.0	0.00E+00	5.55E+03	6.26E+03	12	111
JUN	0.08	0.5	5.21E+01	0.0	0.00E+00	0.0	3.85E+00	0.0	0.00E+00	1.6	2.31E+02	1.1	1.56E+03	0.0	0.00E+00	1.85E+03	2.09E+03	4	115
JUL	0.44	2.9	2.87E+02	0.0	0.00E+00	0.1	2.12E+01	0.0	0.00E+00	8.6	1.27E+03	5.8	8.60E+03	0.0	0.00E+00	1.02E+04	1.15E+04	22	137
AUG	0.45	3.0	2.93E+02	0.0	0.00E+00	0.1	2.16E+01	0.0	0.00E+00	8.8	1.30E+03	6.0	8.79E+03	0.0	0.00E+00	1.04E+04	1.17E+04	22	159
SEP	0.31	2.1	2.02E+02	0.0	0.00E+00	0.1	1.49E+01	0.0	0.00E+00	6.1	8.95E+02	4.1	6.06E+03	0.0	0.00E+00	7.17E+03	8.09E+03	15	174
OCT	0.24	1.6	1.56E+02	0.0	0.00E+00	0.1	1.15E+01	0.0	0.00E+00	4.7	6.93E+02	3.2	4.69E+03	0.0	0.00E+00	5.55E+03	6.26E+03	12	186
NOV	0.31	2.1	2.02E+02	0.0	0.00E+00	0.1	1.49E+01	0.0	0.00E+00	6.1	8.95E+02	4.1	6.06E+03	0.0	0.00E+00	7.17E+03	8.09E+03	15	201
DEC	0.40	2.6	2.61E+02	0.0	0.00E+00	0.1	1.92E+01	0.0	0.00E+00	7.8	1.15E+03	5.3	7.82E+03	0.0	0.00E+00	9.25E+03	1.04E+04	20	221
Total =	4.49	29.7	2.92E+03	0.0	0.00E+00	1.4	2.16E+02	0.0	0.00E+00	87.8	1.30E+04	59.4	8.77E+04	0.0	0.00E+00	1.04E+05	1.18E+05		

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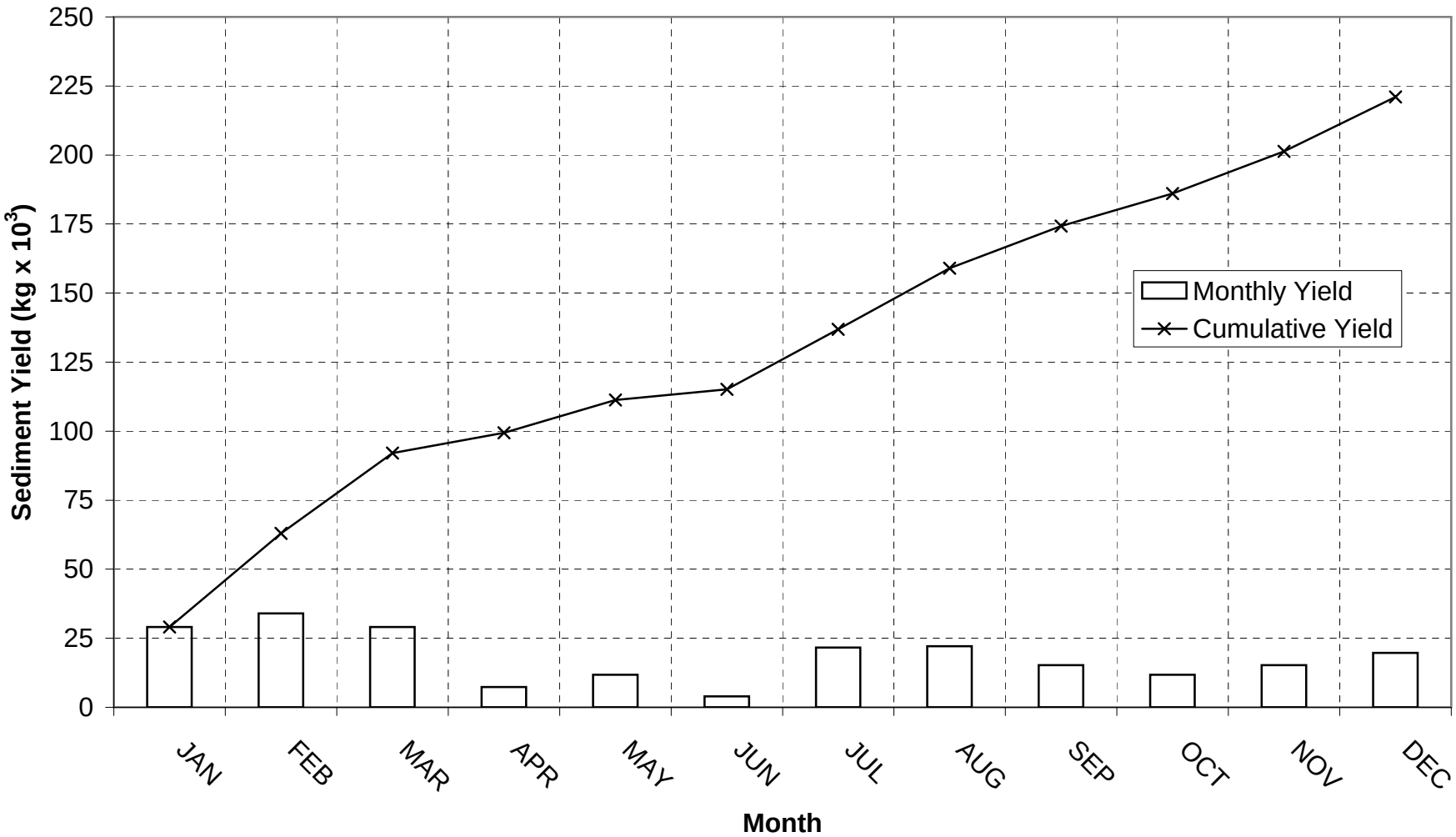
R = Runoff
Y = Sediment Yield



Monthly and cumulative surface erosion sediment yields from Alternative D. Average monthly rainfall depths and predicted land use types were used in the Simple Method for average monthly yield calculations.

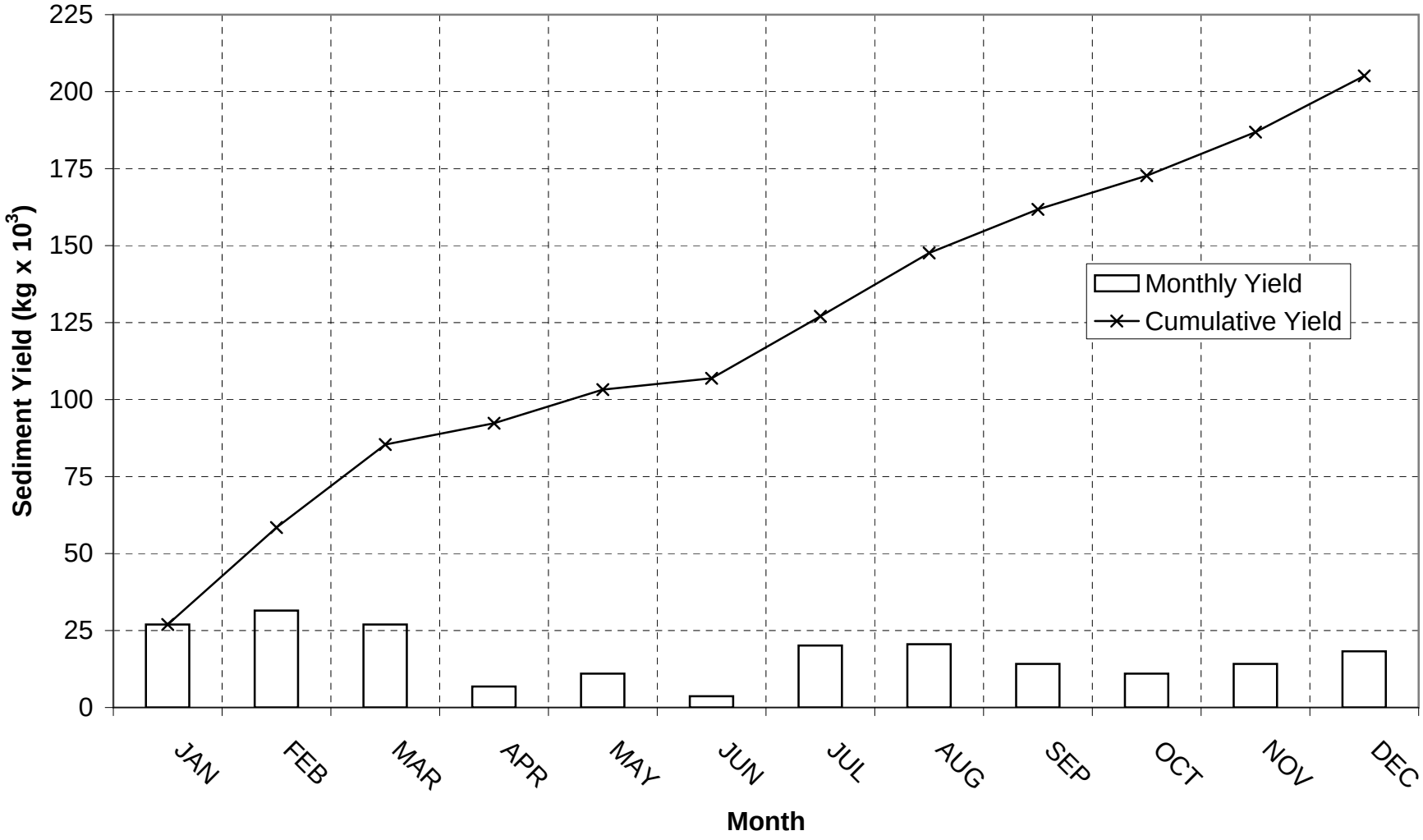
Alternative E

CTA Study Area =	13623	ac
Non Disp. Area =	3613	ac
Disposal Area =	10010	ac
Sediment Load =	2.05E+05	kg/yr

Month	Annual Rainfall	COM Area (%) = 10		IND Area (%) = 0		PAR Area (%) = 5		PUB Area (%) = 0		RES Area (%) = 65		ROA Area (%) = 20		UND Area (%) = 0		Disposal Yield	Non-Disposal[1] Yield	Monthly Yield x 10^3	Cumulative Yield x 10^3
	P_{MON} (in)	R_{COM} (ac-ft)	Y_{COM} (kg/mo)	R_{IND} (ac-ft)	Y_{IND} (kg/mo)	R_{PAR} (ac-ft)	Y_{PAR} (kg/mo)	R_{PUB} (ac-ft)	Y_{PUB} (kg/mo)	R_{RES} (ac-ft)	Y_{RES} (kg/mo)	R_{ROA} (ac-ft)	Y_{ROA} (kg/mo)	R_{UND} (ac-ft)	Y_{UND} (kg/mo)	Y_{DIS} (kg/mo)	Y_{NDIS} (kg/mo)	Y_{MON} (kg/mo)	Y_{CUMM} (kg/mo)
JAN	0.59	4.9	4.79E+02	0.0	0.00E+00	0.2	3.54E+01	0.0	0.00E+00	14.4	2.12E+03	9.7	1.44E+04	0.0	0.00E+00	1.70E+04	9.93E+03	27	27
FEB	0.69	5.7	5.61E+02	0.0	0.00E+00	0.3	4.14E+01	0.0	0.00E+00	16.8	2.48E+03	11.4	1.68E+04	0.0	0.00E+00	1.99E+04	1.16E+04	32	58
MAR	0.59	4.9	4.79E+02	0.0	0.00E+00	0.2	3.54E+01	0.0	0.00E+00	14.4	2.12E+03	9.7	1.44E+04	0.0	0.00E+00	1.70E+04	9.93E+03	27	85
APR	0.15	1.2	1.22E+02	0.0	0.00E+00	0.1	9.00E+00	0.0	0.00E+00	3.7	5.40E+02	2.5	3.66E+03	0.0	0.00E+00	4.33E+03	2.53E+03	7	92
MAY	0.24	2.0	1.95E+02	0.0	0.00E+00	0.1	1.44E+01	0.0	0.00E+00	5.9	8.64E+02	4.0	5.85E+03	0.0	0.00E+00	6.92E+03	4.04E+03	11	103
JUN	0.08	0.7	6.50E+01	0.0	0.00E+00	0.0	4.80E+00	0.0	0.00E+00	2.0	2.88E+02	1.3	1.95E+03	0.0	0.00E+00	2.31E+03	1.35E+03	4	107
JUL	0.44	3.6	3.58E+02	0.0	0.00E+00	0.2	2.64E+01	0.0	0.00E+00	10.7	1.58E+03	7.3	1.07E+04	0.0	0.00E+00	1.27E+04	7.41E+03	20	127
AUG	0.45	3.7	3.66E+02	0.0	0.00E+00	0.2	2.70E+01	0.0	0.00E+00	11.0	1.62E+03	7.4	1.10E+04	0.0	0.00E+00	1.30E+04	7.58E+03	21	148
SEP	0.31	2.6	2.52E+02	0.0	0.00E+00	0.1	1.86E+01	0.0	0.00E+00	7.6	1.12E+03	5.1	7.56E+03	0.0	0.00E+00	8.94E+03	5.22E+03	14	162
OCT	0.24	2.0	1.95E+02	0.0	0.00E+00	0.1	1.44E+01	0.0	0.00E+00	5.9	8.64E+02	4.0	5.85E+03	0.0	0.00E+00	6.92E+03	4.04E+03	11	173
NOV	0.31	2.6	2.52E+02	0.0	0.00E+00	0.1	1.86E+01	0.0	0.00E+00	7.6	1.12E+03	5.1	7.56E+03	0.0	0.00E+00	8.94E+03	5.22E+03	14	187
DEC	0.40	3.3	3.25E+02	0.0	0.00E+00	0.2	2.40E+01	0.0	0.00E+00	9.8	1.44E+03	6.6	9.75E+03	0.0	0.00E+00	1.15E+04	6.74E+03	18	205
Total =	4.49	37.1	3.65E+03	0.0	0.00E+00	1.7	2.70E+02	0.0	0.00E+00	109.6	1.62E+04	74.2	1.09E+05	0.0	0.00E+00	1.30E+05	7.59E+04		

[1]Non-Disposal areas considered 97% undeveloped and 3% roads

Definitions and Notes
COM = Commercial
IND = Industrial
PAR = Parks & Golf Courses
RES = Residential
ROA = Roads
UND = Undeveloped
R = Runoff
Y = Sediment Yield



Monthly and cumulative surface erosion sediment yields from Alternative E. Average monthly rainfall depths and predicted land use types were used in the Simple Method for average monthly yield calculations.

No-Action Alternative

CTA Study Area =	13623 ac
Non Disp. Area =	1473 ac
Disposal Area =	12150 ac
Sediment Load =	1.88E+05 kg/yr

Month	Annual Rainfall	COM		IND		PAR		PUB		RES		ROA		UND		Disposal Yield	Non-Disposal[1] Yield	Monthly Yield x 10^3	Cumulative Yield x 10^3
		Area (%) = 10		Area (%) = 0		Area (%) = 5		Area (%) = 0		Area (%) = 65		Area (%) = 20		Area (%) = 0					
	P_{MON} (in)	R_{COM} (ac-ft)	Y_{COM} (kg/mo)	R_{IND} (ac-ft)	Y_{IND} (kg/mo)	R_{PAR} (ac-ft)	Y_{PAR} (kg/mo)	R_{PUB} (ac-ft)	Y_{PUB} (kg/mo)	R_{RES} (ac-ft)	Y_{RES} (kg/mo)	R_{ROA} (ac-ft)	Y_{ROA} (kg/mo)	R_{UND} (ac-ft)	Y_{UND} (kg/mo)	Y_{DIS} (kg/mo)	Y_{NDIS} (kg/mo)	Y_{MON} (kg/mo)	Y_{CUMM} (kg/mo)
JAN	0.59	5.9	5.82E+02	0.0	0.00E+00	0.3	4.30E+01	0.0	0.00E+00	17.5	2.58E+03	11.8	1.75E+04	0.0	0.00E+00	2.07E+04	3.97E+03	25	25
FEB	0.69	6.9	6.81E+02	0.0	0.00E+00	0.3	5.03E+01	0.0	0.00E+00	20.4	3.02E+03	13.8	2.04E+04	0.0	0.00E+00	2.42E+04	4.65E+03	29	53
MAR	0.59	5.9	5.82E+02	0.0	0.00E+00	0.3	4.30E+01	0.0	0.00E+00	17.5	2.58E+03	11.8	1.75E+04	0.0	0.00E+00	2.07E+04	3.97E+03	25	78
APR	0.15	1.5	1.48E+02	0.0	0.00E+00	0.1	1.09E+01	0.0	0.00E+00	4.4	6.56E+02	3.0	4.44E+03	0.0	0.00E+00	5.25E+03	1.01E+03	6	84
MAY	0.24	2.4	2.37E+02	0.0	0.00E+00	0.1	1.75E+01	0.0	0.00E+00	7.1	1.05E+03	4.8	7.10E+03	0.0	0.00E+00	8.40E+03	1.62E+03	10	94
JUN	0.08	0.8	7.89E+01	0.0	0.00E+00	0.0	5.83E+00	0.0	0.00E+00	2.4	3.50E+02	1.6	2.37E+03	0.0	0.00E+00	2.80E+03	5.39E+02	3	98
JUL	0.44	4.4	4.34E+02	0.0	0.00E+00	0.2	3.21E+01	0.0	0.00E+00	13.0	1.92E+03	8.8	1.30E+04	0.0	0.00E+00	1.54E+04	2.96E+03	18	116
AUG	0.45	4.5	4.44E+02	0.0	0.00E+00	0.2	3.28E+01	0.0	0.00E+00	13.3	1.97E+03	9.0	1.33E+04	0.0	0.00E+00	1.58E+04	3.03E+03	19	135
SEP	0.31	3.1	3.06E+02	0.0	0.00E+00	0.1	2.26E+01	0.0	0.00E+00	9.2	1.36E+03	6.2	9.17E+03	0.0	0.00E+00	1.09E+04	2.09E+03	13	148
OCT	0.24	2.4	2.37E+02	0.0	0.00E+00	0.1	1.75E+01	0.0	0.00E+00	7.1	1.05E+03	4.8	7.10E+03	0.0	0.00E+00	8.40E+03	1.62E+03	10	158
NOV	0.31	3.1	3.06E+02	0.0	0.00E+00	0.1	2.26E+01	0.0	0.00E+00	9.2	1.36E+03	6.2	9.17E+03	0.0	0.00E+00	1.09E+04	2.09E+03	13	171
DEC	0.40	4.0	3.95E+02	0.0	0.00E+00	0.2	2.91E+01	0.0	0.00E+00	11.8	1.75E+03	8.0	1.18E+04	0.0	0.00E+00	1.40E+04	2.69E+03	17	187
Total =	4.49	45.0	4.43E+03	0.0	0.00E+00	2.0	3.27E+02	0.0	0.00E+00	133.0	1.96E+04	90.0	1.33E+05	0.0	0.00E+00	1.57E+05	3.03E+04		

[1]Non-Disposal areas considered 97% undeveloped and 3% roads

Definitions and Notes	
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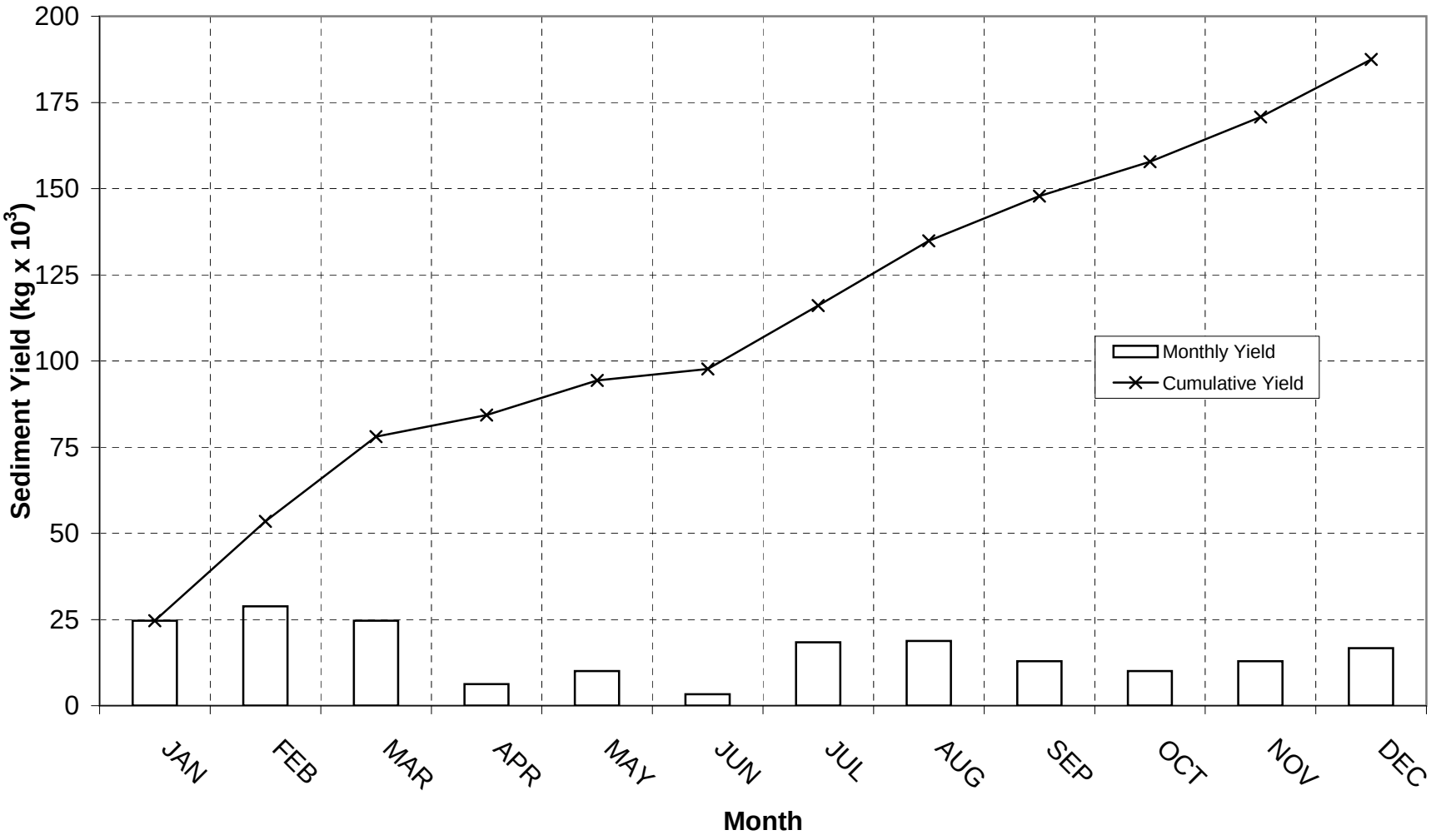

Monthly and cumulative surface erosion sediment yields from No-Action Alternative. Average monthly rainfall depths and predicted land use types were used in the Simple Method for average monthly yield calculations.

APPENDIX B
CURVE NUMBER, SOIL, AND LAG TIME CALCULATIONS

Baseline

Subbasin ID	Within CTA (ac)	Out of CTA (ac)	CN_{NONDIS}	CN_{BAS}
NW187-C	161	4	80	80
116-13	174	1	72	72
116-14	322	13	73	73
223C-21	159	2	73	73
223C-22	164	3	73	73
223C-23	123	38	73	73
223C-24	197	5	77	77
125A-15	131	11	75	75
125A-16	194	6	76	76
116-7	34	165	73	73
223C-17	155	4	73	73
223C-18	165	0	73	73
223C-19	239	0	76	76
125A-12	145	0	76	76
223C-13	154	4	73	73
125A-14	255	29	73	73
223C-14	241	0	75	75
125A-13	337	0	74	74
125A-10	153	0	74	74
125A-11	161	0	74	74
223C-9	196	5	73	73
125A-6	106	0	73	73
125A-7	245	0	73	73
125A-8	210	0	73	73
125A-9	208	1	73	73
125B-3	273	0	73	73
125B-4	245	86	73	73
223B-7	147	0	73	73
223C-1	170	0	73	73
223C-2	175	0	73	73
223C-3	172	3	73	73
223C-4	153	15	73	73
223A-2	246	0	73	73
125A-5	195	0	73	73
125A-4	203	0	73	73
125A-3	224	0	73	73
125A-1	249	0	73	73
125A-2	217	0	73	73
125B-1	197	0	73	73
125B-2	154	52	73	73
223B-2	107	15	73	73
223B-3	155	10	73	73
223B-4	152	4	73	73
223B-5	160	2	73	73
223B-6	123	0	73	73
102B	2067	3623	83	83
102A	625	3390	83	83
SOUTH	2620	6899	80	80

Upper Las Vegas Wash
SCS Lag Time Calculations for Baseline Alternative

Subbasin Data					Overland Time (t_i)			Travel Time (t_t)					Totals	
Subbasin ID	Developed/	Area	CN	K	Length	Slope	t_i	Length	Slope	Velocity (fps)		t_t	t_c	Lag Time
	Undeveloped	(mi^2)			(ft)	(%)	(min)	(ft)	(%)	V_1	V_2	(min)	(min)	(hours)
116-2	U	0.415	73	0.567	100	1	9.6	8150	1.3	1.7	3.4	43.0	52.6	0.53
116-3	U	0.403	72	0.561	100	1	9.7	7000	2.6	2.4	4.7	26.3	36.1	0.36
116-4	U	0.417	72	0.560	100	1	9.7	7100	3.5	2.8	5.5	23.0	32.7	0.33
116-5	U	0.418	73	0.576	100	1	9.4	7100	3.9	2.9	5.8	21.8	31.2	0.31
116-6	U	0.413	72	0.560	100	1	9.7	7150	4.7	3.2	6.4	20.0	29.7	0.30
116-9	U	0.271	75	0.605	100	1	8.9	5400	0.3	0.8	1.6	61.0	69.9	0.70
116-10	U	0.271	75	0.597	100	1	9.1	5000	1.7	1.9	3.8	23.9	32.9	0.33
116-11	U	0.270	72	0.563	100	1	9.7	5600	2	2.1	4.2	24.4	34.1	0.34
116-12	U	0.265	72	0.560	100	1	9.7	5550	2.6	2.4	4.7	21.2	31.0	0.31
116-13	U	0.273	72	0.559	100	1	9.7	5700	0.5	1.0	2.1	49.7	59.4	0.59
116-14	U	0.293	73	0.573	100	1	9.5	5100	1	1.5	2.9	31.7	41.2	0.41
NW187-C	U	0.259	80	0.665	100	1	7.8	7150	0.6	1.1	2.3	55.9	63.8	0.64
116-1	U	0.402	73	0.573	100	1	9.5	7100	1.1	1.6	3.1	41.0	50.5	0.51
116-7	U	0.311	73	0.575	100	1	9.5	6000	0.7	1.2	2.5	44.0	53.5	0.53
116-8	U	0.328	74	0.580	100	1	9.4	6150	0.6	1.1	2.3	48.6	58.0	0.58
125A-5	U	0.234	73	0.574	100	1	9.5	5200	2.5	2.3	4.6	20.4	29.9	0.30
125A-8	U	0.328	73	0.574	100	1	9.5	3500	3.1	2.6	5.2	12.9	22.3	0.22
125A-9	U	0.326	73	0.574	100	1	9.5	3500	3.9	2.9	5.8	11.5	20.9	0.21
125A-10	U	0.239	74	0.587	100	1	9.2	5000	1.1	1.6	3.1	29.7	38.9	0.39
125A-11	U	0.253	74	0.591	100	1	9.2	5450	1.2	1.6	3.2	30.8	39.9	0.40
125A-12	U	0.225	76	0.619	100	1	8.7	4900	0.9	1.4	2.8	32.2	40.9	0.41
125A-13	U	0.519	74	0.588	100	1	9.2	8000	0.9	1.4	2.8	50.8	60.0	0.60
125A-14	U	0.443	73	0.574	100	1	9.5	6700	1.2	1.6	3.2	37.2	46.7	0.47
125A-15	U	0.219	75	0.606	100	1	8.9	4800	1	1.5	2.9	30.0	38.9	0.39
125A-16	U	0.312	76	0.611	100	1	8.8	6650	0.7	1.2	2.5	48.4	57.2	0.57
125B-1	U	0.274	73	0.574	100	1	9.5	5100	2.9	2.5	5.0	18.6	28.1	0.28
125B-2	U	0.293	73	0.574	100	1	9.5	5100	2.8	2.5	4.9	18.9	28.4	0.28
125B-3	U	0.425	73	0.574	100	1	9.5	6950	2.6	2.4	4.7	26.2	35.6	0.36
125B-4	U	0.517	73	0.574	100	1	9.5	7950	2.6	2.4	4.7	29.7	39.2	0.39
125A-1	U	0.278	73	0.574	100	1	9.5	5200	1.8	2.0	3.9	24.1	33.5	0.34

Subbasin Data					Overland Time (t_i)			Travel Time (t_t)					Totals	
Subbasin ID	Developed/	Area	CN	K	Length	Slope	t_i	Length	Slope	Velocity (fps)		t_t	t_c	Lag Time
	Undeveloped	(mi^2)			(ft)	(%)	(min)	(ft)	(%)	V_1	V_2	(min)	(min)	(hours)
125A-2	U	0.269	73	0.574	100	1	9.5	5550	2.5	2.3	4.6	21.7	31.1	0.31
125A-3	U	0.270	73	0.574	100	1	9.5	5550	2.3	2.2	4.5	22.6	32.1	0.32
125A-4	U	0.246	73	0.574	100	1	9.5	5050	2.3	2.2	4.5	20.7	30.2	0.30
125A-6	U	0.165	73	0.574	100	1	9.5	3800	2.1	2.1	4.3	16.8	26.3	0.26
125A-7	U	0.382	73	0.574	100	1	9.5	5000	2.7	2.4	4.8	19.0	28.4	0.28
213A-2	U	0.500	73	0.574	500	10	9.8	8100	3	2.6	5.1	28.1	38.0	0.38
213A-3	U	0.371	73	0.574	100	1	9.5	6850	2.6	2.4	4.7	25.8	35.3	0.35
213A-4	U	0.251	73	0.574	100	1	9.5	5550	2.5	2.3	4.6	21.7	31.1	0.31
OFF1A-2	U	0.378	75	0.600	100	1	9.0	6500	3.4	2.7	5.4	21.5	30.5	0.31
OFF1A-3	U	0.302	74	0.581	100	1	9.3	7150	2.7	2.4	4.8	26.4	35.7	0.36
OFF1A-4	U	0.274	73	0.575	100	1	9.5	6400	2.8	2.5	4.9	23.4	32.8	0.33
213A-6	U	0.279	73	0.574	100	1	9.5	5550	1.3	1.7	3.4	30.0	39.5	0.40
213A-7	U	0.251	73	0.574	100	1	9.5	5500	2.3	2.2	4.5	22.4	31.9	0.32
213A-8	U	0.255	73	0.574	100	1	9.5	5450	2.2	2.2	4.4	22.7	32.2	0.32
213A-9	U	0.252	73	0.574	100	1	9.5	5300	1	1.5	2.9	32.8	42.3	0.42
213A-10	U	0.252	73	0.572	100	1	9.5	5500	2.2	2.2	4.4	22.9	32.4	0.32
213A-11	U	0.256	73	0.573	100	1	9.5	5500	2.3	2.2	4.5	22.4	31.9	0.32
213B-1	U	0.261	73	0.573	100	1	9.5	5500	2.3	2.2	4.5	22.4	31.9	0.32
213B-2	U	0.262	73	0.574	100	1	9.5	5600	2.4	2.3	4.6	22.3	31.8	0.32
213B-3	U	0.253	73	0.574	100	1	9.5	5400	2.3	2.2	4.5	22.0	31.5	0.32
213B-4	U	0.255	73	0.574	100	1	9.5	5500	2.1	2.1	4.3	23.4	32.9	0.33
213B-5	U	0.240	73	0.574	100	1	9.5	4900	1.3	1.7	3.4	26.8	36.3	0.36
213B-6	U	0.244	73	0.574	100	1	9.5	5350	2.1	2.1	4.3	22.9	32.3	0.32
213B-7	U	0.249	73	0.574	100	1	9.5	5200	1.2	1.6	3.2	29.5	38.9	0.39
223A-2	U	0.384	73	0.574	100	1	9.5	4750	2.2	2.2	4.4	20.0	29.5	0.30
223A-3	U	0.250	73	0.574	100	1	9.5	5400	2	2.1	4.2	23.6	33.1	0.33
223B-2	U	0.191	73	0.574	100	1	9.5	3450	1.7	1.9	3.8	17.1	26.6	0.27
223B-3	U	0.257	73	0.574	100	1	9.5	5500	1.6	1.9	3.7	26.9	36.3	0.36
223B-4	U	0.244	73	0.574	100	1	9.5	5400	1.8	2.0	3.9	24.9	34.4	0.34
223B-5	U	0.252	73	0.574	100	1	9.5	5450	1.5	1.8	3.6	27.5	37.0	0.37
223B-6	U	0.192	73	0.574	100	1	9.5	4600	0.9	1.4	2.8	30.4	39.9	0.40
223B-7	U	0.230	73	0.574	100	1	9.5	3800	2	2.1	4.2	17.2	26.7	0.27
223C-1	U	0.266	73	0.574	100	1	9.5	5600	1.7	1.9	3.8	26.5	36.0	0.36
223C-2	U	0.273	73	0.574	100	1	9.5	5650	1.8	2.0	3.9	26.0	35.4	0.35

Subbasin Data					Overland Time (t_i)			Travel Time (t_t)					Totals	
Subbasin ID	Developed/	Area	CN	K	Length	Slope	t_i	Length	Slope	Velocity (fps)		t_t	t_c	Lag Time
	Undeveloped	(mi^2)			(ft)	(%)	(min)	(ft)	(%)	V_1	V_2	(min)	(min)	(hours)
223C-3	U	0.273	73	0.574	100	1	9.5	5650	1.8	2.0	3.9	26.0	35.4	0.35
223C-4	U	0.262	73	0.574	100	1	9.5	5600	0.9	1.4	2.8	36.4	45.9	0.46
223C-5	U	0.219	73	0.574	100	1	9.5	3100	2.5	2.3	4.6	12.9	22.4	0.22
223C-6	U	0.249	73	0.574	100	1	9.5	5400	1.8	2.0	3.9	24.9	34.4	0.34
223C-7	U	0.250	73	0.574	100	1	9.5	5350	1.7	1.9	3.8	25.4	34.9	0.35
223C-8	U	0.251	73	0.574	100	1	9.5	5450	1.7	1.9	3.8	25.8	35.3	0.35
223C-9	U	0.313	73	0.574	100	1	9.5	6000	1.3	1.7	3.4	32.3	41.8	0.42
223C-10	U	0.241	73	0.574	100	1	9.5	3900	2.4	2.3	4.6	16.1	25.6	0.26
223C-11	U	0.250	73	0.574	100	1	9.5	5400	1.9	2.0	4.1	24.2	33.7	0.34
223C-12	U	0.251	73	0.574	100	1	9.5	5500	2	2.1	4.2	24.0	33.5	0.33
223C-13	U	0.247	73	0.574	100	1	9.5	5350	1.9	2.0	4.1	24.0	33.5	0.34
223C-14	U	0.375	75	0.598	100	1	9.0	6700	1.3	1.7	3.4	35.8	44.8	0.45
223C-15	U	0.251	73	0.574	100	1	9.5	4100	2.4	2.3	4.6	16.8	26.3	0.26
223C-16	U	0.251	73	0.574	100	1	9.5	5400	1.9	2.0	4.1	24.2	33.7	0.34
223C-17	U	0.248	73	0.574	100	1	9.5	5400	1.7	1.9	3.8	25.6	35.1	0.35
223C-18	U	0.258	73	0.574	100	1	9.5	5500	1.7	1.9	3.8	26.1	35.5	0.36
223C-19	U	0.373	76	0.619	100	1	8.7	6400	1.2	1.6	3.2	35.7	44.3	0.44
223C-20	U	0.265	73	0.574	100	1	9.5	4150	2.5	2.3	4.6	16.6	26.1	0.26
223C-21	U	0.252	73	0.574	100	1	9.5	5400	1.8	2.0	3.9	24.9	34.4	0.34
223C-22	U	0.262	73	0.574	100	1	9.5	5500	1.5	1.8	3.6	27.7	37.2	0.37
223C-23	U	0.253	73	0.576	100	1	9.4	5400	1.5	1.8	3.6	27.3	36.7	0.37
223C-24	U	0.315	77	0.632	100	1	8.4	6850	1.2	1.6	3.2	38.0	46.4	0.46
NW1-C	U	0.293	81	0.676	100	1	7.6	6400	3.4	2.7	5.4	21.2	28.8	0.29
NW2-C	U	0.395	73	0.574	100	1	9.5	7300	2.2	2.2	4.4	29.8	39.3	0.39
NW5-C	U	0.275	73	0.574	100	1	9.5	5650	2.1	2.1	4.3	24.0	33.5	0.34
NW7-C	U	0.488	84	0.720	100	1	6.8	9700	3.2	2.6	5.3	32.3	39.1	0.39
NW9-C	U	0.273	73	0.574	100	1	9.5	6200	2.3	2.2	4.5	25.0	34.5	0.34
NW11-C	U	0.270	73	0.574	100	1	9.5	5600	2.6	2.4	4.7	21.4	30.9	0.31
NW17-C	U	0.430	73	0.574	100	1	9.5	7750	2.2	2.2	4.4	31.5	41.0	0.41
NW21-C	U	0.403	84	0.723	100	1	6.8	7850	3.1	2.6	5.2	26.9	33.6	0.34
NW23-C	U	0.376	73	0.574	100	1	9.5	6900	2.1	2.1	4.3	28.9	38.4	0.38
NW33-C	U	0.248	86	0.745	100	1	6.4	5400	2.8	2.5	4.9	20.0	26.4	0.26
NW35-C	U	0.434	83	0.710	100	1	7.0	5100	3.5	2.8	5.5	16.9	24.0	0.24
NW50-C	U	0.358	73	0.574	100	1	9.5	6300	3.3	2.7	5.3	21.2	30.7	0.31

Subbasin Data					Overland Time (t_i)			Travel Time (t_t)					Totals	
Subbasin ID	Developed/	Area	CN	K	Length	Slope	t_i	Length	Slope	Velocity (fps)		t_t	t_c	Lag Time
	Undeveloped	(mi^2)			(ft)	(%)	(min)	(ft)	(%)	V_1	V_2	(min)	(min)	(hours)
NW51-C	U	0.306	73	0.574	100	1	9.5	5100	3.2	2.6	5.3	17.7	27.2	0.27
NW64-C	U	0.407	73	0.574	100	1	9.5	7500	2.8	2.5	4.9	27.1	36.6	0.37
NW102-C	U	0.412	73	0.574	100	1	9.5	8600	2.2	2.2	4.4	34.8	44.2	0.44
NW130-C	U	0.241	75	0.606	100	1	8.9	6550	1.5	1.8	3.6	32.6	41.5	0.42
OFF1A-5	U	0.418	73	0.574	100	1	9.5	7650	2.5	2.3	4.6	29.2	38.7	0.39
OFF1A-6	U	0.473	73	0.574	500	10	9.8	8300	3.5	2.8	5.5	26.6	36.5	0.36
OFF2A	U	0.318	73	0.574	100	1	9.5	6200	2.5	2.3	4.6	24.0	33.5	0.33
OFF2B	U	0.160	73	0.574	500	10	9.8	3700	3.5	2.8	5.5	12.7	22.5	0.23
OFF3	U	0.222	73	0.574	100	1	9.5	5200	2.4	2.3	4.6	20.8	30.3	0.30
OFF4-1	U	0.301	77	0.628	100	1	8.5	10400	6.2	3.7	7.3	24.8	33.3	0.33
OFF4-2	U	0.420	79	0.659	100	1	7.9	4600	12.7	5.3	10.5	8.1	16.0	0.16
OFF5-1	U	0.297	80	0.672	100	1	7.7	6700	6	3.6	7.2	16.6	24.4	0.24
OFF5-2	U	0.395	86	0.742	100	1	6.4	10000	4.8	3.2	6.4	27.2	33.6	0.34
OFF8	U	0.272	86	0.745	500	10	6.6	6500	3.9	2.9	5.8	20.1	26.7	0.27
OFF9	U	0.303	86	0.745	500	10	6.6	11100	4	3.0	5.9	32.9	39.5	0.39

Alternative A

Subbasin ID	Non-Disposal (ac)	Disposal (ac)	Out of CTA (ac)	CN_{NONDIS}	CN_{DIS}	CN_A
NW187-C	161	0	4	80	91	80
116-13	174	0	1	72	88	72
116-14	228	93	13	73	88	77
223C-21	159	1	2	73	88	73
223C-22	163	1	3	73	88	73
223C-23	14	109	38	73	88	83
223C-24	186	11	5	77	90	78
125A-15	131	0	11	75	90	75
125A-16	194	0	6	76	90	76
116-7	34	0	165	73	89	73
223C-17	155	0	4	73	88	73
223C-18	162	3	0	73	88	73
223C-19	177	62	0	76	89	80
125A-12	145	1	0	76	90	77
223C-13	153	1	4	73	88	73
125A-14	254	0	29	73	89	73
223C-14	241	1	0	75	89	75
125A-13	336	0	0	74	89	74
125A-10	153	0	0	74	89	74
125A-11	161	0	0	74	89	74
223C-9	196	1	5	73	88	73
125A-6	106	0	0	73	89	73
125A-7	245	1	0	73	88	73
125A-8	210	1	0	73	88	73
125A-9	209	0	1	73	88	73
125B-3	272	0	0	73	88	73
125B-4	241	5	86	73	88	73
223B-7	147	0	0	73	88	73
223C-1	170	0	0	73	88	73
223C-2	175	1	0	73	88	73
223C-3	172	1	3	73	88	73
223C-4	153	0	15	73	88	73
223A-2	246	1	0	73	88	73
125A-5	195	0	0	73	88	73
125A-4	203	0	0	73	88	73
125A-3	224	0	0	73	88	73
125A-1	249	0	0	73	88	73
125A-2	217	0	0	73	88	73
125B-1	197	0	0	73	88	73
125B-2	154	0	52	73	88	73
223B-2	107	1	15	73	88	73
223B-3	151	4	10	73	88	73
223B-4	144	8	4	73	88	74
223B-5	154	6	2	73	88	74
223B-6	123	0	0	73	88	73
102B	2061	6	3623	83	92	83
102A	620	5	3390	83	92	83
SOUTH	2114	506	6899	80	91	80

Upper Las Vegas Wash
SCS Lag Time Calculations for Alternative A

Subbasin Data					Overland Time (t_i)			Travel Time (t_t)					Totals	
Subbasin ID	Developed/	Area	CN	K	Length	Slope	t_i	Length	Slope	Velocity (fps)		t_t	t_c	Lag Time
	Undeveloped	(mi^2)			(ft)	(%)	(min)	(ft)	(%)	V_1	V_2	(min)	(min)	(hours)
116-2	U	0.415	73	0.567	100	1	9.6	8150	1.3	1.7	3.4	43.0	52.6	0.53
116-3	U	0.403	72	0.561	100	1	9.7	7000	2.6	2.4	4.7	26.3	36.1	0.36
116-4	U	0.417	72	0.560	100	1	9.7	7100	3.5	2.8	5.5	23.0	32.7	0.33
116-5	U	0.418	73	0.576	100	1	9.4	7100	3.9	2.9	5.8	21.8	31.2	0.31
116-6	U	0.413	72	0.560	100	1	9.7	7150	4.7	3.2	6.4	20.0	29.7	0.30
116-9	U	0.271	75	0.605	100	1	8.9	5400	0.3	0.8	1.6	61.0	69.9	0.70
116-10	U	0.271	75	0.597	100	1	9.1	5000	1.7	1.9	3.8	23.9	32.9	0.33
116-11	U	0.270	72	0.563	100	1	9.7	5600	2	2.1	4.2	24.4	34.1	0.34
116-12	U	0.265	72	0.560	100	1	9.7	5550	2.6	2.4	4.7	21.2	31.0	0.31
116-13	U	0.273	72	0.559	100	1	9.7	5700	0.5	1.0	2.1	49.7	59.4	0.59
116-14	U	0.293	77	0.626	100	1	8.5	5100	1	1.5	2.9	31.7	40.2	0.40
NW187-C	U	0.259	80	0.665	100	1	7.8	7150	0.6	1.1	2.3	55.9	63.8	0.64
116-1	U	0.402	73	0.573	100	1	9.5	7100	1.1	1.6	3.1	41.0	50.5	0.51
116-7	U	0.311	73	0.575	100	1	9.5	6000	0.7	1.2	2.5	44.0	53.5	0.53
116-8	U	0.328	74	0.580	100	1	9.4	6150	0.6	1.1	2.3	48.6	58.0	0.58
125A-5	U	0.234	73	0.574	100	1	9.5	5200	2.5	2.3	4.6	20.4	29.9	0.30
125A-8	U	0.328	73	0.574	100	1	9.5	3500	3.1	2.6	5.2	12.9	22.3	0.22
125A-9	U	0.326	73	0.574	100	1	9.5	3500	3.9	2.9	5.8	11.5	20.9	0.21
125A-10	U	0.239	74	0.587	100	1	9.2	5000	1.1	1.6	3.1	29.7	38.9	0.39
125A-11	U	0.253	74	0.591	100	1	9.2	5450	1.2	1.6	3.2	30.8	39.9	0.40
125A-12	U	0.225	76	0.619	100	1	8.7	4900	0.9	1.4	2.8	32.2	40.9	0.41
125A-13	U	0.519	74	0.588	100	1	9.2	8000	0.9	1.4	2.8	50.8	60.0	0.60
125A-14	U	0.443	73	0.574	100	1	9.5	6700	1.2	1.6	3.2	37.2	46.7	0.47
125A-15	U	0.219	75	0.606	100	1	8.9	4800	1	1.5	2.9	30.0	38.9	0.39
125A-16	U	0.312	76	0.611	100	1	8.8	6650	0.7	1.2	2.5	48.4	57.2	0.57
125B-1	U	0.274	73	0.574	100	1	9.5	5100	2.9	2.5	5.0	18.6	28.1	0.28
125B-2	U	0.293	73	0.574	100	1	9.5	5100	2.8	2.5	4.9	18.9	28.4	0.28
125B-3	U	0.425	73	0.574	100	1	9.5	6950	2.6	2.4	4.7	26.2	35.6	0.36
125B-4	U	0.517	73	0.574	100	1	9.5	7950	2.6	2.4	4.7	29.7	39.2	0.39
125A-1	U	0.278	73	0.574	100	1	9.5	5200	1.8	2.0	3.9	24.1	33.5	0.34

Subbasin Data					Overland Time (t_i)			Travel Time (t_t)					Totals	
Subbasin ID	Developed/	Area	CN	K	Length	Slope	t_i	Length	Slope	Velocity (fps)		t_t	t_c	Lag Time
	Undeveloped	(mi^2)			(ft)	(%)	(min)	(ft)	(%)	V_1	V_2	(min)	(min)	(hours)
125A-2	U	0.269	73	0.574	100	1	9.5	5550	2.5	2.3	4.6	21.7	31.1	0.31
125A-3	U	0.270	73	0.574	100	1	9.5	5550	2.3	2.2	4.5	22.6	32.1	0.32
125A-4	U	0.246	73	0.574	100	1	9.5	5050	2.3	2.2	4.5	20.7	30.2	0.30
125A-6	U	0.165	73	0.574	100	1	9.5	3800	2.1	2.1	4.3	16.8	26.3	0.26
125A-7	U	0.382	73	0.574	100	1	9.5	5000	2.7	2.4	4.8	19.0	28.4	0.28
213A-2	U	0.500	73	0.574	500	10	9.8	8100	3	2.6	5.1	28.1	38.0	0.38
213A-3	U	0.371	73	0.574	100	1	9.5	6850	2.6	2.4	4.7	25.8	35.3	0.35
213A-4	U	0.251	73	0.574	100	1	9.5	5550	2.5	2.3	4.6	21.7	31.1	0.31
OFF1A-2	U	0.378	74	0.591	100	1	9.2	6500	3.4	2.7	5.4	21.5	30.7	0.31
OFF1A-3	U	0.302	74	0.581	100	1	9.3	7150	2.7	2.4	4.8	26.4	35.7	0.36
OFF1A-4	U	0.274	73	0.575	100	1	9.5	6400	2.8	2.5	4.9	23.4	32.8	0.33
213A-6	U	0.279	73	0.574	100	1	9.5	5550	1.3	1.7	3.4	30.0	39.5	0.40
213A-7	U	0.251	73	0.574	100	1	9.5	5500	2.3	2.2	4.5	22.4	31.9	0.32
213A-8	U	0.255	73	0.574	100	1	9.5	5450	2.2	2.2	4.4	22.7	32.2	0.32
213A-9	U	0.252	73	0.574	100	1	9.5	5300	1	1.5	2.9	32.8	42.3	0.42
213A-10	U	0.252	73	0.572	100	1	9.5	5500	2.2	2.2	4.4	22.9	32.4	0.32
213A-11	U	0.256	73	0.573	100	1	9.5	5500	2.3	2.2	4.5	22.4	31.9	0.32
213B-1	U	0.261	73	0.573	100	1	9.5	5500	2.3	2.2	4.5	22.4	31.9	0.32
213B-2	U	0.262	73	0.574	100	1	9.5	5600	2.4	2.3	4.6	22.3	31.8	0.32
213B-3	U	0.253	73	0.574	100	1	9.5	5400	2.3	2.2	4.5	22.0	31.5	0.32
213B-4	U	0.255	73	0.574	100	1	9.5	5500	2.1	2.1	4.3	23.4	32.9	0.33
213B-5	U	0.240	73	0.574	100	1	9.5	4900	1.3	1.7	3.4	26.8	36.3	0.36
213B-6	U	0.244	73	0.574	100	1	9.5	5350	2.1	2.1	4.3	22.9	32.3	0.32
213B-7	U	0.249	73	0.574	100	1	9.5	5200	1.2	1.6	3.2	29.5	38.9	0.39
223A-2	U	0.384	73	0.574	100	1	9.5	4750	2.2	2.2	4.4	20.0	29.5	0.30
223A-3	U	0.250	73	0.574	100	1	9.5	5400	2	2.1	4.2	23.6	33.1	0.33
223B-2	U	0.191	73	0.574	100	1	9.5	3450	1.7	1.9	3.8	17.1	26.6	0.27
223B-3	U	0.257	73	0.574	100	1	9.5	5500	1.6	1.9	3.7	26.9	36.3	0.36
223B-4	U	0.244	73	0.574	100	1	9.5	5400	1.8	2.0	3.9	24.9	34.4	0.34
223B-5	U	0.252	73	0.574	100	1	9.5	5450	1.5	1.8	3.6	27.5	37.0	0.37
223B-6	U	0.192	73	0.574	100	1	9.5	4600	0.9	1.4	2.8	30.4	39.9	0.40
223B-7	U	0.230	73	0.574	100	1	9.5	3800	2	2.1	4.2	17.2	26.7	0.27
223C-1	U	0.266	73	0.574	100	1	9.5	5600	1.7	1.9	3.8	26.5	36.0	0.36
223C-2	U	0.273	73	0.574	100	1	9.5	5650	1.8	2.0	3.9	26.0	35.4	0.35

Subbasin Data					Overland Time (t_i)			Travel Time (t_t)					Totals	
Subbasin ID	Developed/	Area	CN	K	Length	Slope	t_i	Length	Slope	Velocity (fps)		t_t	t_c	Lag Time
	Undeveloped	(mi^2)			(ft)	(%)	(min)	(ft)	(%)	V_1	V_2	(min)	(min)	(hours)
223C-3	U	0.273	73	0.574	100	1	9.5	5650	1.8	2.0	3.9	26.0	35.4	0.35
223C-4	U	0.262	73	0.574	100	1	9.5	5600	0.9	1.4	2.8	36.4	45.9	0.46
223C-5	U	0.219	73	0.574	100	1	9.5	3100	2.5	2.3	4.6	12.9	22.4	0.22
223C-6	U	0.249	73	0.574	100	1	9.5	5400	1.8	2.0	3.9	24.9	34.4	0.34
223C-7	U	0.250	73	0.574	100	1	9.5	5350	1.7	1.9	3.8	25.4	34.9	0.35
223C-8	U	0.251	73	0.574	100	1	9.5	5450	1.7	1.9	3.8	25.8	35.3	0.35
223C-9	U	0.313	73	0.574	100	1	9.5	6000	1.3	1.7	3.4	32.3	41.8	0.42
223C-10	U	0.241	73	0.574	100	1	9.5	3900	2.4	2.3	4.6	16.1	25.6	0.26
223C-11	U	0.250	73	0.574	100	1	9.5	5400	1.9	2.0	4.1	24.2	33.7	0.34
223C-12	U	0.251	73	0.574	100	1	9.5	5500	2	2.1	4.2	24.0	33.5	0.33
223C-13	U	0.247	73	0.574	100	1	9.5	5350	1.9	2.0	4.1	24.0	33.5	0.34
223C-14	U	0.375	75	0.598	100	1	9.0	6700	1.3	1.7	3.4	35.8	44.8	0.45
223C-15	U	0.251	73	0.574	100	1	9.5	4100	2.4	2.3	4.6	16.8	26.3	0.26
223C-16	U	0.251	73	0.574	100	1	9.5	5400	1.9	2.0	4.1	24.2	33.7	0.34
223C-17	U	0.248	73	0.574	100	1	9.5	5400	1.7	1.9	3.8	25.6	35.1	0.35
223C-18	U	0.258	73	0.574	100	1	9.5	5500	1.7	1.9	3.8	26.1	35.5	0.36
223C-19	U	0.373	80	0.666	100	1	7.8	6400	1.2	1.6	3.2	35.7	43.5	0.43
223C-20	U	0.265	73	0.574	100	1	9.5	4150	2.5	2.3	4.6	16.6	26.1	0.26
223C-21	U	0.252	73	0.574	100	1	9.5	5400	1.8	2.0	3.9	24.9	34.4	0.34
223C-22	U	0.262	73	0.574	100	1	9.5	5500	1.5	1.8	3.6	27.7	37.2	0.37
223C-23	U	0.253	83	0.706	100	1	7.1	5400	1.5	1.8	3.6	27.3	34.4	0.34
223C-24	U	0.315	78	0.640	100	1	8.3	6850	1.2	1.6	3.2	38.0	46.3	0.46
NW1-C	U	0.293	81	0.676	100	1	7.6	6400	3.4	2.7	5.4	21.2	28.8	0.29
NW2-C	U	0.395	73	0.574	100	1	9.5	7300	2.2	2.2	4.4	29.8	39.3	0.39
NW5-C	U	0.275	73	0.574	100	1	9.5	5650	2.1	2.1	4.3	24.0	33.5	0.34
NW7-C	U	0.488	84	0.720	100	1	6.8	9700	3.2	2.6	5.3	32.3	39.1	0.39
NW9-C	U	0.273	73	0.574	100	1	9.5	6200	2.3	2.2	4.5	25.0	34.5	0.34
NW11-C	U	0.270	73	0.574	100	1	9.5	5600	2.6	2.4	4.7	21.4	30.9	0.31
NW17-C	U	0.430	73	0.574	100	1	9.5	7750	2.2	2.2	4.4	31.5	41.0	0.41
NW21-C	U	0.403	84	0.723	100	1	6.8	7850	3.1	2.6	5.2	26.9	33.6	0.34
NW23-C	U	0.376	73	0.574	100	1	9.5	6900	2.1	2.1	4.3	28.9	38.4	0.38
NW33-C	U	0.248	86	0.745	100	1	6.4	5400	2.8	2.5	4.9	20.0	26.4	0.26
NW35-C	U	0.434	83	0.710	100	1	7.0	5100	3.5	2.8	5.5	16.9	24.0	0.24
NW50-C	U	0.358	73	0.574	100	1	9.5	6300	3.3	2.7	5.3	21.2	30.7	0.31

Subbasin Data					Overland Time (t_i)			Travel Time (t_t)					Totals	
Subbasin ID	**Developed/**	**Area**	**CN**	**K**	**Length**	**Slope**	**t_i**	**Length**	**Slope**	**Velocity (fps)**		**t_t**	**t_c**	**Lag Time**
	Undeveloped	**(mi^2)**			**(ft)**	**(%)**	**(min)**	**(ft)**	**(%)**	**V_1**	**V_2**	**(min)**	**(min)**	**(hours)**
NW51-C	U	0.306	73	0.574	100	1	9.5	5100	3.2	2.6	5.3	17.7	27.2	0.27
NW64-C	U	0.407	73	0.574	100	1	9.5	7500	2.8	2.5	4.9	27.1	36.6	0.37
NW102-C	U	0.412	73	0.574	100	1	9.5	8600	2.2	2.2	4.4	34.8	44.2	0.44
NW130-C	U	0.241	75	0.606	100	1	8.9	6550	1.5	1.8	3.6	32.6	41.5	0.42
OFF1A-5	U	0.418	73	0.574	100	1	9.5	7650	2.5	2.3	4.6	29.2	38.7	0.39
OFF1A-6	U	0.473	73	0.574	500	10	9.8	8300	3.5	2.8	5.5	26.6	36.5	0.36
OFF2A	U	0.318	73	0.574	100	1	9.5	6200	2.5	2.3	4.6	24.0	33.5	0.33
OFF2B	U	0.160	73	0.574	500	10	9.8	3700	3.5	2.8	5.5	12.7	22.5	0.23
OFF3	U	0.222	73	0.574	100	1	9.5	5200	2.4	2.3	4.6	20.8	30.3	0.30
OFF4-1	U	0.301	77	0.628	100	1	8.5	10400	6.2	3.7	7.3	24.8	33.3	0.33
OFF4-2	U	0.420	79	0.659	100	1	7.9	4600	12.7	5.3	10.5	8.1	16.0	0.16
OFF5-1	U	0.297	80	0.672	100	1	7.7	6700	6	3.6	7.2	16.6	24.4	0.24
OFF5-2	U	0.395	86	0.742	100	1	6.4	10000	4.8	3.2	6.4	27.2	33.6	0.34
OFF8	U	0.272	86	0.745	500	10	6.6	6500	3.9	2.9	5.8	20.1	26.7	0.27
OFF9	U	0.303	86	0.745	500	10	6.6	11100	4	3.0	5.9	32.9	39.5	0.39

Alternative B

Subbasin ID	Non-Disposal (ac)	Disposal (ac)	Out of CTA (ac)	CN_{NONDIS}	CN_{DIS}	CN_B
NW187-C	161	1	4	80	91	80
116-13	174	0	1	72	88	72
116-14	306	16	13	73	88	74
223C-21	0	159	2	73	88	88
223C-22	0	164	3	73	88	88
223C-23	46	77	38	73	88	80
223C-24	197	0	5	77	90	77
125A-15	131	0	11	75	90	75
125A-16	194	1	6	76	90	76
116-7	34	0	165	73	89	73
223C-17	0	155	4	73	88	88
223C-18	16	149	0	73	88	87
223C-19	226	13	0	76	89	77
125A-12	144	1	0	76	90	77
223C-13	10	144	4	73	88	87
125A-14	254	1	29	73	89	73
223C-14	210	31	0	75	89	77
125A-13	336	1	0	74	89	74
125A-10	153	0	0	74	89	74
125A-11	161	0	0	74	89	74
223C-9	164	32	5	73	88	75
125A-6	106	1	0	73	89	73
125A-7	245	1	0	73	88	73
125A-8	209	1	0	73	88	73
125A-9	208	0	1	73	88	73
125B-3	272	1	0	73	88	73
125B-4	244	1	86	73	88	73
223B-7	0	147	0	73	88	88
223C-1	0	170	0	73	88	88
223C-2	175	0	0	73	88	73
223C-3	172	1	3	73	88	73
223C-4	153	0	15	73	88	73
223A-2	0	246	0	73	88	88
125A-5	195	1	0	73	88	73
125A-4	203	1	0	73	88	73
125A-3	224	1	0	73	88	73
125A-1	249	1	0	73	88	73
125A-2	216	2	0	73	88	73
125B-1	197	1	0	73	88	73
125B-2	154	0	52	73	88	73
223B-2	0	107	15	73	88	86
223B-3	0	155	10	73	88	87
223B-4	0	152	4	73	88	88
223B-5	160	0	2	73	88	73
223B-6	123	0	0	73	88	73
102B	1803	264	3623	83	92	83
102A	625	0	3390	83	92	83
SOUTH	2135	485	6899	80	91	80

Upper Las Vegas Wash
SCS Lag Time Calculations for Alternative B

Subbasin Data					Overland Time (t_i)			Travel Time (t_t)					Totals	
Subbasin ID	Developed/	Area	CN	K	Length	Slope	t_i	Length	Slope	Velocity (fps)		t_t	t_c	Lag Time
	Undeveloped	(mi^2)			(ft)	(%)	(min)	(ft)	(%)	V_1	V_2	(min)	(min)	(hours)
116-2	U	0.415	73	0.567	100	1	9.6	8150	1.3	1.7	3.4	43.0	52.6	0.53
116-3	U	0.403	72	0.561	100	1	9.7	7000	2.6	2.4	4.7	26.3	36.1	0.36
116-4	U	0.417	72	0.560	100	1	9.7	7100	3.5	2.8	5.5	23.0	32.7	0.33
116-5	U	0.418	73	0.576	100	1	9.4	7100	3.9	2.9	5.8	21.8	31.2	0.31
116-6	U	0.413	72	0.560	100	1	9.7	7150	4.7	3.2	6.4	20.0	29.7	0.30
116-9	U	0.271	75	0.605	100	1	8.9	5400	0.3	0.8	1.6	61.0	69.9	0.70
116-10	U	0.271	75	0.597	100	1	9.1	5000	1.7	1.9	3.8	23.9	32.9	0.33
116-11	U	0.270	72	0.563	100	1	9.7	5600	2	2.1	4.2	24.4	34.1	0.34
116-12	U	0.265	72	0.560	100	1	9.7	5550	2.6	2.4	4.7	21.2	31.0	0.31
116-13	U	0.273	72	0.559	100	1	9.7	5700	0.5	1.0	2.1	49.7	59.4	0.59
116-14	U	0.293	74	0.587	100	1	9.2	5100	1	1.5	2.9	31.7	40.9	0.41
NW187-C	U	0.259	80	0.665	100	1	7.8	7150	0.6	1.1	2.3	55.9	63.8	0.64
116-1	U	0.402	73	0.573	100	1	9.5	7100	1.1	1.6	3.1	41.0	50.5	0.51
116-7	U	0.311	73	0.575	100	1	9.5	6000	0.7	1.2	2.5	44.0	53.5	0.53
116-8	U	0.328	74	0.580	100	1	9.4	6150	0.6	1.1	2.3	48.6	58.0	0.58
125A-5	U	0.234	73	0.574	100	1	9.5	5200	2.5	2.3	4.6	20.4	29.9	0.30
125A-8	U	0.328	73	0.574	100	1	9.5	3500	3.1	2.6	5.2	12.9	22.3	0.22
125A-9	U	0.326	73	0.574	100	1	9.5	3500	3.9	2.9	5.8	11.5	20.9	0.21
125A-10	U	0.239	74	0.587	100	1	9.2	5000	1.1	1.6	3.1	29.7	38.9	0.39
125A-11	U	0.253	74	0.591	100	1	9.2	5450	1.2	1.6	3.2	30.8	39.9	0.40
125A-12	U	0.225	76	0.619	100	1	8.7	4900	0.9	1.4	2.8	32.2	40.9	0.41
125A-13	U	0.519	74	0.588	100	1	9.2	8000	0.9	1.4	2.8	50.8	60.0	0.60
125A-14	U	0.443	73	0.574	100	1	9.5	6700	1.2	1.6	3.2	37.2	46.7	0.47
125A-15	U	0.219	75	0.606	100	1	8.9	4800	1	1.5	2.9	30.0	38.9	0.39
125A-16	U	0.312	76	0.611	100	1	8.8	6650	0.7	1.2	2.5	48.4	57.2	0.57
125B-1	U	0.274	73	0.574	100	1	9.5	5100	2.9	2.5	5.0	18.6	28.1	0.28
125B-2	U	0.293	73	0.574	100	1	9.5	5100	2.8	2.5	4.9	18.9	28.4	0.28
125B-3	U	0.425	73	0.574	100	1	9.5	6950	2.6	2.4	4.7	26.2	35.6	0.36
125B-4	U	0.517	73	0.574	100	1	9.5	7950	2.6	2.4	4.7	29.7	39.2	0.39
125A-1	U	0.278	73	0.574	100	1	9.5	5200	1.8	2.0	3.9	24.1	33.5	0.34

Subbasin Data					Overland Time (t_i)			Travel Time (t_t)					Totals	
Subbasin ID	Developed/	Area	CN	K	Length	Slope	t_i	Length	Slope	Velocity (fps)		t_t	t_c	Lag Time
	Undeveloped	(mi^2)			(ft)	(%)	(min)	(ft)	(%)	V_1	V_2	(min)	(min)	(hours)
125A-2	U	0.269	73	0.574	100	1	9.5	5550	2.5	2.3	4.6	21.7	31.1	0.31
125A-3	U	0.270	73	0.574	100	1	9.5	5550	2.3	2.2	4.5	22.6	32.1	0.32
125A-4	U	0.246	73	0.574	100	1	9.5	5050	2.3	2.2	4.5	20.7	30.2	0.30
125A-6	U	0.165	73	0.574	100	1	9.5	3800	2.1	2.1	4.3	16.8	26.3	0.26
125A-7	U	0.382	73	0.574	100	1	9.5	5000	2.7	2.4	4.8	19.0	28.4	0.28
213A-2	U	0.500	73	0.574	500	10	9.8	8100	3	2.6	5.1	28.1	38.0	0.38
213A-3	U	0.371	73	0.574	100	1	9.5	6850	2.6	2.4	4.7	25.8	35.3	0.35
213A-4	U	0.251	73	0.574	100	1	9.5	5550	2.5	2.3	4.6	21.7	31.1	0.31
OFF1A-2	U	0.378	74	0.591	100	1	9.2	6500	3.4	2.7	5.4	21.5	30.7	0.31
OFF1A-3	U	0.302	74	0.581	100	1	9.3	7150	2.7	2.4	4.8	26.4	35.7	0.36
OFF1A-4	U	0.274	73	0.575	100	1	9.5	6400	2.8	2.5	4.9	23.4	32.8	0.33
213A-6	U	0.279	73	0.574	100	1	9.5	5550	1.3	1.7	3.4	30.0	39.5	0.40
213A-7	U	0.251	73	0.574	100	1	9.5	5500	2.3	2.2	4.5	22.4	31.9	0.32
213A-8	U	0.255	73	0.574	100	1	9.5	5450	2.2	2.2	4.4	22.7	32.2	0.32
213A-9	U	0.252	73	0.574	100	1	9.5	5300	1	1.5	2.9	32.8	42.3	0.42
213A-10	U	0.252	73	0.572	100	1	9.5	5500	2.2	2.2	4.4	22.9	32.4	0.32
213A-11	U	0.256	73	0.573	100	1	9.5	5500	2.3	2.2	4.5	22.4	31.9	0.32
213B-1	U	0.261	73	0.573	100	1	9.5	5500	2.3	2.2	4.5	22.4	31.9	0.32
213B-2	U	0.262	73	0.574	100	1	9.5	5600	2.4	2.3	4.6	22.3	31.8	0.32
213B-3	U	0.253	73	0.574	100	1	9.5	5400	2.3	2.2	4.5	22.0	31.5	0.32
213B-4	U	0.255	73	0.574	100	1	9.5	5500	2.1	2.1	4.3	23.4	32.9	0.33
213B-5	U	0.240	73	0.574	100	1	9.5	4900	1.3	1.7	3.4	26.8	36.3	0.36
213B-6	U	0.244	73	0.574	100	1	9.5	5350	2.1	2.1	4.3	22.9	32.3	0.32
213B-7	U	0.249	73	0.574	100	1	9.5	5200	1.2	1.6	3.2	29.5	38.9	0.39
223A-2	D	0.384	88	0.772	100	1	5.9	4750	2.2	3.0	4.5	18.4	24.3	0.24
223A-3	U	0.250	73	0.574	100	1	9.5	5400	2	2.1	4.2	23.6	33.1	0.33
223B-2	U	0.191	86	0.745	100	1	6.4	3450	1.7	1.9	3.8	17.1	23.5	0.24
223B-3	D	0.257	87	0.758	100	1	6.1	5500	1.6	2.6	3.9	24.8	30.9	0.31
223B-4	D	0.244	88	0.772	100	1	5.9	5400	1.8	2.7	4.1	23.0	28.9	0.29
223B-5	U	0.252	73	0.574	100	1	9.5	5450	1.5	1.8	3.6	27.5	37.0	0.37
223B-6	U	0.192	73	0.574	100	1	9.5	4600	0.9	1.4	2.8	30.4	39.9	0.40
223B-7	D	0.230	88	0.772	100	1	5.9	3800	2	2.9	4.3	15.6	21.5	0.22
223C-1	D	0.266	88	0.772	100	1	5.9	5600	1.7	2.6	4.0	24.5	30.4	0.30
223C-2	U	0.273	73	0.574	100	1	9.5	5650	1.8	2.0	3.9	26.0	35.4	0.35

Subbasin Data					Overland Time (t_i)			Travel Time (t_t)					Totals	
Subbasin ID	Developed/	Area	CN	K	Length	Slope	t_i	Length	Slope	Velocity (fps)		t_t	t_c	Lag Time
	Undeveloped	(mi^2)			(ft)	(%)	(min)	(ft)	(%)	V_1	V_2	(min)	(min)	(hours)
223C-3	U	0.273	73	0.574	100	1	9.5	5650	1.8	2.0	3.9	26.0	35.4	0.35
223C-4	U	0.262	73	0.574	100	1	9.5	5600	0.9	1.4	2.8	36.4	45.9	0.46
223C-5	U	0.219	73	0.574	100	1	9.5	3100	2.5	2.3	4.6	12.9	22.4	0.22
223C-6	U	0.249	73	0.574	100	1	9.5	5400	1.8	2.0	3.9	24.9	34.4	0.34
223C-7	U	0.250	73	0.574	100	1	9.5	5350	1.7	1.9	3.8	25.4	34.9	0.35
223C-8	U	0.251	73	0.574	100	1	9.5	5450	1.7	1.9	3.8	25.8	35.3	0.35
223C-9	U	0.313	73	0.574	100	1	9.5	6000	1.3	1.7	3.4	32.3	41.8	0.42
223C-10	U	0.241	73	0.574	100	1	9.5	3900	2.4	2.3	4.6	16.1	25.6	0.26
223C-11	U	0.250	73	0.574	100	1	9.5	5400	1.9	2.0	4.1	24.2	33.7	0.34
223C-12	U	0.251	73	0.574	100	1	9.5	5500	2	2.1	4.2	24.0	33.5	0.33
223C-13	D	0.247	87	0.758	100	1	6.1	5350	1.9	2.8	4.2	22.2	28.3	0.28
223C-14	U	0.375	77	0.626	100	1	8.5	6700	1.3	1.7	3.4	35.8	44.3	0.44
223C-15	U	0.251	73	0.574	100	1	9.5	4100	2.4	2.3	4.6	16.8	26.3	0.26
223C-16	U	0.251	73	0.574	100	1	9.5	5400	1.9	2.0	4.1	24.2	33.7	0.34
223C-17	D	0.248	88	0.772	100	1	5.9	5400	1.7	2.6	4.0	23.6	29.5	0.30
223C-18	D	0.258	87	0.758	100	1	6.1	5500	1.7	2.6	4.0	24.1	30.2	0.30
223C-19	U	0.373	77	0.626	100	1	8.5	6400	1.2	1.6	3.2	35.7	44.2	0.44
223C-20	U	0.265	73	0.574	100	1	9.5	4150	2.5	2.3	4.6	16.6	26.1	0.26
223C-21	D	0.252	88	0.772	100	1	5.9	5400	1.8	2.7	4.1	23.0	28.9	0.29
223C-22	D	0.262	88	0.772	100	1	5.9	5500	1.5	2.5	3.7	25.6	31.5	0.32
223C-23	U	0.253	80	0.666	100	1	7.8	5400	1.5	1.8	3.6	27.3	35.1	0.35
223C-24	U	0.315	77	0.632	100	1	8.4	6850	1.2	1.6	3.2	38.0	46.4	0.46
NW1-C	U	0.293	81	0.676	100	1	7.6	6400	3.4	2.7	5.4	21.2	28.8	0.29
NW2-C	U	0.395	73	0.574	100	1	9.5	7300	2.2	2.2	4.4	29.8	39.3	0.39
NW5-C	U	0.275	73	0.574	100	1	9.5	5650	2.1	2.1	4.3	24.0	33.5	0.34
NW7-C	U	0.488	84	0.720	100	1	6.8	9700	3.2	2.6	5.3	32.3	39.1	0.39
NW9-C	U	0.273	73	0.574	100	1	9.5	6200	2.3	2.2	4.5	25.0	34.5	0.34
NW11-C	U	0.270	73	0.574	100	1	9.5	5600	2.6	2.4	4.7	21.4	30.9	0.31
NW17-C	U	0.430	73	0.574	100	1	9.5	7750	2.2	2.2	4.4	31.5	41.0	0.41
NW21-C	U	0.403	84	0.723	100	1	6.8	7850	3.1	2.6	5.2	26.9	33.6	0.34
NW23-C	U	0.376	73	0.574	100	1	9.5	6900	2.1	2.1	4.3	28.9	38.4	0.38
NW33-C	U	0.248	86	0.745	100	1	6.4	5400	2.8	2.5	4.9	20.0	26.4	0.26
NW35-C	U	0.434	83	0.710	100	1	7.0	5100	3.5	2.8	5.5	16.9	24.0	0.24
NW50-C	U	0.358	73	0.574	100	1	9.5	6300	3.3	2.7	5.3	21.2	30.7	0.31

Subbasin Data					Overland Time (t_i)			Travel Time (t_t)					Totals	
Subbasin ID	**Developed/**	**Area**	**CN**	**K**	**Length**	**Slope**	**t_i**	**Length**	**Slope**	**Velocity (fps)**		**t_t**	**t_c**	**Lag Time**
	Undeveloped	**(mi^2)**			**(ft)**	**(%)**	**(min)**	**(ft)**	**(%)**	**V_1**	**V_2**	**(min)**	**(min)**	**(hours)**
NW51-C	U	0.306	73	0.574	100	1	9.5	5100	3.2	2.6	5.3	17.7	27.2	0.27
NW64-C	U	0.407	73	0.574	100	1	9.5	7500	2.8	2.5	4.9	27.1	36.6	0.37
NW102-C	U	0.412	73	0.574	100	1	9.5	8600	2.2	2.2	4.4	34.8	44.2	0.44
NW130-C	U	0.241	75	0.606	100	1	8.9	6550	1.5	1.8	3.6	32.6	41.5	0.42
OFF1A-5	U	0.418	73	0.574	100	1	9.5	7650	2.5	2.3	4.6	29.2	38.7	0.39
OFF1A-6	U	0.473	73	0.574	500	10	9.8	8300	3.5	2.8	5.5	26.6	36.5	0.36
OFF2A	U	0.318	73	0.574	100	1	9.5	6200	2.5	2.3	4.6	24.0	33.5	0.33
OFF2B	U	0.160	73	0.574	500	10	9.8	3700	3.5	2.8	5.5	12.7	22.5	0.23
OFF3	U	0.222	73	0.574	100	1	9.5	5200	2.4	2.3	4.6	20.8	30.3	0.30
OFF4-1	U	0.301	77	0.628	100	1	8.5	10400	6.2	3.7	7.3	24.8	33.3	0.33
OFF4-2	U	0.420	79	0.659	100	1	7.9	4600	12.7	5.3	10.5	8.1	16.0	0.16
OFF5-1	U	0.297	80	0.672	100	1	7.7	6700	6	3.6	7.2	16.6	24.4	0.24
OFF5-2	U	0.395	86	0.742	100	1	6.4	10000	4.8	3.2	6.4	27.2	33.6	0.34
OFF8	U	0.272	86	0.745	500	10	6.6	6500	3.9	2.9	5.8	20.1	26.7	0.27
OFF9	U	0.303	86	0.745	500	10	6.6	11100	4	3.0	5.9	32.9	39.5	0.39

Alternative C

Subbasin ID	Non-Disposal (ac)	Disposal (ac)	Out of CTA (ac)	CN_{NONDIS}	CN_{DIS}	CN_C
NW187-C	161	0	4	80	91	80
116-13	174	0	1	72	88	72
116-14	228	93	13	73	88	77
223C-21	0	159	2	73	88	88
223C-22	0	164	3	73	88	88
223C-23	14	109	38	73	88	83
223C-24	186	11	5	77	90	78
125A-15	132	0	11	75	90	75
125A-16	194	0	6	76	90	76
116-7	34	0	165	73	89	73
223C-17	0	155	4	73	88	88
223C-18	0	165	0	73	88	88
223C-19	178	62	0	76	89	80
125A-12	145	1	0	76	90	77
223C-13	0	154	4	73	88	88
125A-14	227	27	29	73	89	75
223C-14	168	74	0	75	89	79
125A-13	311	25	0	74	89	75
125A-10	153	0	0	74	89	74
125A-11	149	12	0	74	89	75
223C-9	149	47	5	73	88	77
125A-6	105	1	0	73	89	73
125A-7	185	61	0	73	88	77
125A-8	50	161	0	73	88	84
125A-9	0	208	1	73	88	88
125B-3	0	273	0	73	88	88
125B-4	0	245	86	73	88	84
223B-7	0	147	0	73	88	88
223C-1	0	170	0	73	88	88
223C-2	0	175	0	73	88	88
223C-3	28	144	3	73	88	85
223C-4	119	34	15	73	88	76
223A-2	0	246	0	73	88	88
125A-5	0	195	0	73	88	88
125A-4	0	203	0	73	88	88
125A-3	0	224	0	73	88	88
125A-1	199	50	0	73	88	76
125A-2	46	171	0	73	88	85
125B-1	0	197	0	73	88	88
125B-2	0	154	52	73	88	84
223B-2	0	107	15	73	88	86
223B-3	0	155	10	73	88	87
223B-4	0	152	4	73	88	88
223B-5	25	136	2	73	88	86
223B-6	118	5	0	73	88	74
102B	414	1653	3623	83	92	86
102A	307	318	3390	83	92	84
SOUTH	2111	509	6899	80	91	80

Upper Las Vegas Wash
SCS Lag Time Calculations for Alternative C

Subbasin Data					Overland Time (t_i)			Travel Time (t_t)					Totals	
Subbasin ID	Developed/	Area	CN	K	Length	Slope	t_i	Length	Slope	Velocity (fps)		t_t	t_c	Lag Time
	Undeveloped	(mi^2)			(ft)	(%)	(min)	(ft)	(%)	V_1	V_2	(min)	(min)	(hours)
116-2	U	0.415	73	0.567	100	1	9.6	8150	1.3	1.7	3.4	43.0	52.6	0.526
116-3	U	0.403	72	0.561	100	1	9.7	7000	2.6	2.4	4.7	26.3	36.1	0.361
116-4	U	0.417	72	0.560	100	1	9.7	7100	3.5	2.8	5.5	23.0	32.7	0.327
116-5	U	0.418	73	0.576	100	1	9.4	7100	3.9	2.9	5.8	21.8	31.2	0.312
116-6	U	0.413	72	0.560	100	1	9.7	7150	4.7	3.2	6.4	20.0	29.7	0.297
116-9	U	0.271	75	0.605	100	1	8.9	5400	0.3	0.8	1.6	61.0	69.9	0.699
116-10	U	0.271	75	0.597	100	1	9.1	5000	1.7	1.9	3.8	23.9	32.9	0.329
116-11	U	0.270	72	0.563	100	1	9.7	5600	2	2.1	4.2	24.4	34.1	0.341
116-12	U	0.265	72	0.560	100	1	9.7	5550	2.6	2.4	4.7	21.2	31.0	0.310
116-13	U	0.273	72	0.559	100	1	9.7	5700	0.5	1.0	2.1	49.7	59.4	0.594
116-14	U	0.293	77	0.626	100	1	8.5	5100	1	1.5	2.9	31.7	40.2	0.402
NW187-C	U	0.259	80	0.665	100	1	7.8	7150	0.6	1.1	2.3	55.9	63.8	0.638
116-1	U	0.402	73	0.573	100	1	9.5	7100	1.1	1.6	3.1	41.0	50.5	0.505
116-7	U	0.311	73	0.575	100	1	9.5	6000	0.7	1.2	2.5	44.0	53.5	0.535
116-8	U	0.328	74	0.580	100	1	9.4	6150	0.6	1.1	2.3	48.6	58.0	0.580
125A-5	D	0.234	88	0.772	100	1	5.9	5200	2.5	3.2	4.8	18.8	24.7	0.247
125A-8	D	0.328	84	0.719	100	1	6.9	3500	3.1	3.6	5.4	11.6	18.5	0.185
125A-9	D	0.326	88	0.772	100	1	5.9	3500	3.9	4.0	6.0	10.4	16.3	0.163
125A-10	U	0.239	74	0.587	100	1	9.2	5000	1.1	1.6	3.1	29.7	38.9	0.389
125A-11	U	0.253	75	0.600	100	1	9.0	5450	1.2	1.6	3.2	30.8	39.8	0.398
125A-12	U	0.225	76	0.619	100	1	8.7	4900	0.9	1.4	2.8	32.2	40.9	0.409
125A-13	U	0.519	75	0.600	100	1	9.0	8000	0.9	1.4	2.8	50.8	59.8	0.598
125A-14	U	0.443	75	0.600	100	1	9.0	6700	1.2	1.6	3.2	37.2	46.2	0.462
125A-15	U	0.219	75	0.606	100	1	8.9	4800	1	1.5	2.9	30.0	38.9	0.389
125A-16	U	0.312	76	0.611	100	1	8.8	6650	0.7	1.2	2.5	48.4	57.2	0.572
125B-1	D	0.274	88	0.772	100	1	5.9	5100	2.9	3.4	5.2	17.1	23.0	0.230
125B-2	D	0.293	84	0.719	100	1	6.9	5100	2.8	3.4	5.1	17.4	24.3	0.243
125B-3	D	0.425	88	0.772	100	1	5.9	6950	2.6	3.3	4.9	24.3	30.3	0.303
125B-4	D	0.517	84	0.719	100	1	6.9	7950	2.6	3.3	4.9	27.7	34.6	0.346
125A-1	U	0.278	76	0.613	100	1	8.8	5200	1.8	2.0	3.9	24.1	32.8	0.328

Subbasin Data					Overland Time (t_i)			Travel Time (t_t)					Totals	
Subbasin ID	Developed/	Area	CN	K	Length	Slope	t_i	Length	Slope	Velocity (fps)		t_t	t_c	Lag Time
	Undeveloped	(mi^2)			(ft)	(%)	(min)	(ft)	(%)	V_1	V_2	(min)	(min)	(hours)
125A-2	D	0.269	85	0.732	100	1	6.6	5550	2.5	3.2	4.8	20.0	26.6	0.266
125A-3	D	0.270	88	0.772	100	1	5.9	5550	2.3	3.1	4.6	20.9	26.8	0.268
125A-4	D	0.246	88	0.772	100	1	5.9	5050	2.3	3.1	4.6	19.1	25.0	0.250
125A-6	U	0.165	73	0.574	100	1	9.5	3800	2.1	2.1	4.3	16.8	26.3	0.263
125A-7	U	0.382	77	0.626	100	1	8.5	5000	2.7	2.4	4.8	19.0	27.5	0.275
213A-2	U	0.500	73	0.574	500	10	9.8	8100	3	2.6	5.1	28.1	38.0	0.380
213A-3	U	0.371	73	0.574	100	1	9.5	6850	2.6	2.4	4.7	25.8	35.3	0.353
213A-4	U	0.251	73	0.574	100	1	9.5	5550	2.5	2.3	4.6	21.7	31.1	0.311
OFF1A-2	U	0.378	74	0.591	100	1	9.2	6500	3.4	2.7	5.4	21.5	30.7	0.307
OFF1A-3	U	0.302	74	0.581	100	1	9.3	7150	2.7	2.4	4.8	26.4	35.7	0.357
OFF1A-4	U	0.274	73	0.575	100	1	9.5	6400	2.8	2.5	4.9	23.4	32.8	0.328
213A-6	U	0.279	73	0.574	100	1	9.5	5550	1.3	1.7	3.4	30.0	39.5	0.395
213A-7	U	0.251	73	0.574	100	1	9.5	5500	2.3	2.2	4.5	22.4	31.9	0.319
213A-8	U	0.255	73	0.574	100	1	9.5	5450	2.2	2.2	4.4	22.7	32.2	0.322
213A-9	U	0.252	73	0.574	100	1	9.5	5300	1	1.5	2.9	32.8	42.3	0.423
213A-10	U	0.252	73	0.572	100	1	9.5	5500	2.2	2.2	4.4	22.9	32.4	0.324
213A-11	U	0.256	73	0.573	100	1	9.5	5500	2.3	2.2	4.5	22.4	31.9	0.319
213B-1	U	0.261	73	0.573	100	1	9.5	5500	2.3	2.2	4.5	22.4	31.9	0.319
213B-2	U	0.262	73	0.574	100	1	9.5	5600	2.4	2.3	4.6	22.3	31.8	0.318
213B-3	U	0.253	73	0.574	100	1	9.5	5400	2.3	2.2	4.5	22.0	31.5	0.315
213B-4	U	0.255	73	0.574	100	1	9.5	5500	2.1	2.1	4.3	23.4	32.9	0.329
213B-5	U	0.240	73	0.574	100	1	9.5	4900	1.3	1.7	3.4	26.8	36.3	0.363
213B-6	U	0.244	73	0.574	100	1	9.5	5350	2.1	2.1	4.3	22.9	32.3	0.323
213B-7	U	0.249	73	0.574	100	1	9.5	5200	1.2	1.6	3.2	29.5	38.9	0.389
223A-2	D	0.384	88	0.772	100	1	5.9	4750	2.2	3.0	4.5	18.4	24.3	0.243
223A-3	U	0.250	73	0.574	100	1	9.5	5400	2	2.1	4.2	23.6	33.1	0.331
223B-2	D	0.191	86	0.745	100	1	6.4	3450	1.7	2.6	4.0	15.5	21.9	0.219
223B-3	D	0.257	87	0.758	100	1	6.1	5500	1.6	2.6	3.9	24.8	30.9	0.309
223B-4	D	0.244	88	0.772	100	1	5.9	5400	1.8	2.7	4.1	23.0	28.9	0.289
223B-5	D	0.252	86	0.745	100	1	6.4	5450	1.5	2.5	3.7	25.4	31.8	0.318
223B-6	U	0.192	74	0.587	100	1	9.2	4600	0.9	1.4	2.8	30.4	39.7	0.397
223B-7	D	0.230	88	0.772	100	1	5.9	3800	2	2.9	4.3	15.6	21.5	0.215
223C-1	D	0.266	88	0.772	100	1	5.9	5600	1.7	2.6	4.0	24.5	30.4	0.304
223C-2	D	0.273	88	0.772	100	1	5.9	5650	1.8	2.7	4.1	24.0	29.9	0.299

Subbasin Data					Overland Time (t_i)			Travel Time (t_t)					Totals	
Subbasin ID	Developed/	Area	CN	K	Length	Slope	t_i	Length	Slope	Velocity (fps)		t_t	t_c	Lag Time
	Undeveloped	(mi^2)			(ft)	(%)	(min)	(ft)	(%)	V_1	V_2	(min)	(min)	(hours)
223C-3	D	0.273	85	0.732	100	1	6.6	5650	1.8	2.7	4.1	24.0	30.6	0.306
223C-4	D	0.262	76	0.613	100	1	8.8	5600	0.9	1.9	2.9	33.6	42.4	0.424
223C-5	U	0.219	73	0.574	100	1	9.5	3100	2.5	2.3	4.6	12.9	22.4	0.224
223C-6	U	0.249	73	0.574	100	1	9.5	5400	1.8	2.0	3.9	24.9	34.4	0.344
223C-7	U	0.250	73	0.574	100	1	9.5	5350	1.7	1.9	3.8	25.4	34.9	0.349
223C-8	U	0.251	73	0.574	100	1	9.5	5450	1.7	1.9	3.8	25.8	35.3	0.353
223C-9	U	0.313	77	0.626	100	1	8.5	6000	1.3	1.7	3.4	32.3	40.8	0.408
223C-10	U	0.241	73	0.574	100	1	9.5	3900	2.4	2.3	4.6	16.1	25.6	0.256
223C-11	U	0.250	73	0.574	100	1	9.5	5400	1.9	2.0	4.1	24.2	33.7	0.337
223C-12	U	0.251	73	0.574	100	1	9.5	5500	2	2.1	4.2	24.0	33.5	0.335
223C-13	D	0.247	88	0.772	100	1	5.9	5350	1.9	2.8	4.2	22.2	28.1	0.281
223C-14	U	0.375	79	0.653	100	1	8.0	6700	1.3	1.7	3.4	35.8	43.8	0.438
223C-15	U	0.251	73	0.574	100	1	9.5	4100	2.4	2.3	4.6	16.8	26.3	0.263
223C-16	U	0.251	73	0.574	100	1	9.5	5400	1.9	2.0	4.1	24.2	33.7	0.337
223C-17	D	0.248	88	0.772	100	1	5.9	5400	1.7	2.6	4.0	23.6	29.5	0.295
223C-18	D	0.258	88	0.772	100	1	5.9	5500	1.7	2.6	4.0	24.1	30.0	0.300
223C-19	D	0.373	80	0.666	100	1	7.8	6400	1.2	2.2	3.4	33.1	40.9	0.409
223C-20	U	0.265	73	0.574	100	1	9.5	4150	2.5	2.3	4.6	16.6	26.1	0.261
223C-21	D	0.252	88	0.772	100	1	5.9	5400	1.8	2.7	4.1	23.0	28.9	0.289
223C-22	D	0.262	88	0.772	100	1	5.9	5500	1.5	2.5	3.7	25.6	31.5	0.315
223C-23	D	0.253	83	0.706	100	1	7.1	5400	1.5	2.5	3.7	25.2	32.3	0.323
223C-24	U	0.315	78	0.640	100	1	8.3	6850	1.2	1.6	3.2	38.0	46.3	0.463
NW1-C	U	0.293	81	0.676	100	1	7.6	6400	3.4	2.7	5.4	21.2	28.8	0.288
NW2-C	U	0.395	73	0.574	100	1	9.5	7300	2.2	2.2	4.4	29.8	39.3	0.393
NW5-C	U	0.275	73	0.574	100	1	9.5	5650	2.1	2.1	4.3	24.0	33.5	0.335
NW7-C	U	0.488	84	0.720	100	1	6.8	9700	3.2	2.6	5.3	32.3	39.1	0.391
NW9-C	U	0.273	73	0.574	100	1	9.5	6200	2.3	2.2	4.5	25.0	34.5	0.345
NW11-C	U	0.270	73	0.574	100	1	9.5	5600	2.6	2.4	4.7	21.4	30.9	0.309
NW17-C	U	0.430	73	0.574	100	1	9.5	7750	2.2	2.2	4.4	31.5	41.0	0.410
NW21-C	U	0.403	84	0.723	100	1	6.8	7850	3.1	2.6	5.2	26.9	33.6	0.336
NW23-C	U	0.376	73	0.574	100	1	9.5	6900	2.1	2.1	4.3	28.9	38.4	0.384
NW33-C	U	0.248	86	0.745	100	1	6.4	5400	2.8	2.5	4.9	20.0	26.4	0.264
NW35-C	U	0.434	83	0.710	100	1	7.0	5100	3.5	2.8	5.5	16.9	24.0	0.240
NW50-C	U	0.358	73	0.574	100	1	9.5	6300	3.3	2.7	5.3	21.2	30.7	0.307

Subbasin Data					Overland Time (t_i)			Travel Time (t_t)					Totals	
Subbasin ID	**Developed/**	**Area**	**CN**	**K**	**Length**	**Slope**	**t_i**	**Length**	**Slope**	**Velocity (fps)**		**t_t**	**t_c**	**Lag Time**
	Undeveloped	**(mi^2)**			**(ft)**	**(%)**	**(min)**	**(ft)**	**(%)**	**V_1**	**V_2**	**(min)**	**(min)**	**(hours)**
NW51-C	U	0.306	73	0.574	100	1	9.5	5100	3.2	2.6	5.3	17.7	27.2	0.272
NW64-C	U	0.407	73	0.574	100	1	9.5	7500	2.8	2.5	4.9	27.1	36.6	0.366
NW102-C	U	0.412	73	0.574	100	1	9.5	8600	2.2	2.2	4.4	34.8	44.2	0.442
NW130-C	U	0.241	75	0.606	100	1	8.9	6550	1.5	1.8	3.6	32.6	41.5	0.415
OFF1A-5	U	0.418	73	0.574	100	1	9.5	7650	2.5	2.3	4.6	29.2	38.7	0.387
OFF1A-6	U	0.473	73	0.574	500	10	9.8	8300	3.5	2.8	5.5	26.6	36.5	0.365
OFF2A	U	0.318	73	0.574	100	1	9.5	6200	2.5	2.3	4.6	24.0	33.5	0.335
OFF2B	U	0.160	73	0.574	500	10	9.8	3700	3.5	2.8	5.5	12.7	22.5	0.225
OFF3	U	0.222	73	0.574	100	1	9.5	5200	2.4	2.3	4.6	20.8	30.3	0.303
OFF4-1	U	0.301	77	0.628	100	1	8.5	10400	6.2	3.7	7.3	24.8	33.3	0.333
OFF4-2	U	0.420	79	0.659	100	1	7.9	4600	12.7	5.3	10.5	8.1	16.0	0.160
OFF5-1	U	0.297	80	0.672	100	1	7.7	6700	6	3.6	7.2	16.6	24.4	0.244
OFF5-2	U	0.395	86	0.742	100	1	6.4	10000	4.8	3.2	6.4	27.2	33.6	0.336
OFF8	U	0.272	86	0.745	500	10	6.6	6500	3.9	2.9	5.8	20.1	26.7	0.267
OFF9	U	0.303	86	0.745	500	10	6.6	11100	4	3.0	5.9	32.9	39.5	0.395

Alternative D

Subbasin ID	Non-Disposal (ac)	Disposal (ac)	Out of CTA (ac)	CN_{NONDIS}	CN_{DIS}	CN_D
NW187-C	161	0	4	80	91	80
116-13	174	0	1	72	88	72
116-14	228	93	13	73	88	77
223C-21	0	159	2	73	88	88
223C-22	0	164	3	73	88	88
223C-23	0	123	38	73	88	85
223C-24	106	91	5	77	90	83
125A-15	132	0	11	75	90	75
125A-16	194	0	6	76	90	76
116-7	34	0	165	73	89	73
223C-17	0	155	4	73	88	88
223C-18	0	165	0	73	88	88
223C-19	125	114	0	76	89	83
125A-12	145	1	0	76	90	77
223C-13	0	154	4	73	88	88
125A-14	62	193	29	73	89	84
223C-14	110	132	0	75	89	83
125A-13	127	209	0	74	89	83
125A-10	94	60	0	74	89	80
125A-11	66	95	0	74	89	83
223C-9	89	108	5	73	88	81
125A-6	73	33	0	73	89	78
125A-7	102	143	0	73	88	82
125A-8	0	210	0	73	88	88
125A-9	0	208	1	73	88	88
125B-3	0	273	0	73	88	88
125B-4	0	245	86	73	88	84
223B-7	0	147	0	73	88	88
223C-1	0	170	0	73	88	88
223C-2	0	175	0	73	88	88
223C-3	0	172	3	73	88	88
223C-4	98	55	15	73	88	78
223A-2	0	246	0	73	88	88
125A-5	0	195	0	73	88	88
125A-4	0	203	0	73	88	88
125A-3	0	224	0	73	88	88
125A-1	130	119	0	73	88	80
125A-2	0	217	0	73	88	88
125B-1	0	197	0	73	88	88
125B-2	0	154	52	73	88	84
223B-2	0	107	15	73	88	86
223B-3	0	155	10	73	88	87
223B-4	0	152	4	73	88	88
223B-5	0	160	2	73	88	88
223B-6	78	45	0	73	88	79
102B	381	1687	3623	83	92	86
102A	312	313	3390	83	92	84
SOUTH	2266	354	6899	80	91	80

Upper Las Vegas Wash
SCS Lag Time Calculations for Alternative D

Subbasin Data					Overland Time (t_i)			Travel Time (t_t)					Totals	
Subbasin ID	Developed/	Area	CN	K	Length	Slope	t_i	Length	Slope	Velocity (fps)		t_t	t_c	Lag Time
	Undeveloped	(mi^2)			(ft)	(%)	(min)	(ft)	(%)	V_1	V_2	(min)	(min)	(hours)
116-2	U	0.415	73	0.567	100	1	9.6	8150	1.3	1.7	3.4	43.0	52.6	0.53
116-3	U	0.403	72	0.561	100	1	9.7	7000	2.6	2.4	4.7	26.3	36.1	0.36
116-4	U	0.417	72	0.560	100	1	9.7	7100	3.5	2.8	5.5	23.0	32.7	0.33
116-5	U	0.418	73	0.576	100	1	9.4	7100	3.9	2.9	5.8	21.8	31.2	0.31
116-6	U	0.413	72	0.560	100	1	9.7	7150	4.7	3.2	6.4	20.0	29.7	0.30
116-9	U	0.271	75	0.605	100	1	8.9	5400	0.3	0.8	1.6	61.0	69.9	0.70
116-10	U	0.271	75	0.597	100	1	9.1	5000	1.7	1.9	3.8	23.9	32.9	0.33
116-11	U	0.270	72	0.563	100	1	9.7	5600	2	2.1	4.2	24.4	34.1	0.34
116-12	U	0.265	72	0.560	100	1	9.7	5550	2.6	2.4	4.7	21.2	31.0	0.31
116-13	U	0.273	72	0.559	100	1	9.7	5700	0.5	1.0	2.1	49.7	59.4	0.59
116-14	U	0.293	77	0.626	100	1	8.5	5100	1	1.5	2.9	31.7	40.2	0.40
NW187-C	U	0.259	80	0.665	100	1	7.8	7150	0.6	1.1	2.3	55.9	63.8	0.64
116-1	U	0.402	73	0.573	100	1	9.5	7100	1.1	1.6	3.1	41.0	50.5	0.51
116-7	U	0.311	73	0.575	100	1	9.5	6000	0.7	1.2	2.5	44.0	53.5	0.53
116-8	U	0.328	74	0.580	100	1	9.4	6150	0.6	1.1	2.3	48.6	58.0	0.58
125A-5	D	0.234	88	0.772	100	1	5.9	5200	2.5	3.2	4.8	18.8	24.7	0.25
125A-8	D	0.328	88	0.772	100	1	5.9	3500	3.1	3.6	5.4	11.6	17.5	0.18
125A-9	D	0.326	88	0.772	100	1	5.9	3500	3.9	4.0	6.0	10.4	16.3	0.16
125A-10	U	0.239	80	0.666	100	1	7.8	5000	1.1	1.6	3.1	29.7	37.5	0.38
125A-11	D	0.253	83	0.706	100	1	7.1	5450	1.2	2.2	3.4	28.4	35.5	0.35
125A-12	U	0.225	76	0.619	100	1	8.7	4900	0.9	1.4	2.8	32.2	40.9	0.41
125A-13	D	0.519	83	0.706	100	1	7.1	8000	0.9	1.9	2.9	47.4	54.5	0.55
125A-14	D	0.443	84	0.719	100	1	6.9	6700	1.2	2.2	3.4	34.6	41.5	0.41
125A-15	U	0.219	75	0.606	100	1	8.9	4800	1	1.5	2.9	30.0	38.9	0.39
125A-16	U	0.312	76	0.611	100	1	8.8	6650	0.7	1.2	2.5	48.4	57.2	0.57
125B-1	D	0.274	88	0.772	100	1	5.9	5100	2.9	3.4	5.2	17.1	23.0	0.23
125B-2	D	0.293	84	0.719	100	1	6.9	5100	2.8	3.4	5.1	17.4	24.3	0.24
125B-3	D	0.425	88	0.772	100	1	5.9	6950	2.6	3.3	4.9	24.3	30.3	0.30
125B-4	D	0.517	84	0.719	100	1	6.9	7950	2.6	3.3	4.9	27.7	34.6	0.35
125A-1	D	0.278	80	0.666	100	1	7.8	5200	1.8	2.7	4.1	22.2	30.0	0.30

Subbasin Data					Overland Time (t_i)			Travel Time (t_t)					Totals	
Subbasin ID	Developed/	Area	CN	K	Length	Slope	t_i	Length	Slope	Velocity (fps)		t_t	t_c	Lag Time
	Undeveloped	(mi^2)			(ft)	(%)	(min)	(ft)	(%)	V_1	V_2	(min)	(min)	(hours)
125A-2	D	0.269	88	0.772	100	1	5.9	5550	2.5	3.2	4.8	20.0	25.9	0.26
125A-3	D	0.270	88	0.772	100	1	5.9	5550	2.3	3.1	4.6	20.9	26.8	0.27
125A-4	D	0.246	88	0.772	100	1	5.9	5050	2.3	3.1	4.6	19.1	25.0	0.25
125A-6	U	0.165	78	0.640	100	1	8.3	3800	2.1	2.1	4.3	16.8	25.1	0.25
125A-7	D	0.382	82	0.692	100	1	7.3	5000	2.7	3.3	5.0	17.4	24.8	0.25
213A-2	U	0.500	73	0.574	500	10	9.8	8100	3	2.6	5.1	28.1	38.0	0.38
213A-3	U	0.371	73	0.574	100	1	9.5	6850	2.6	2.4	4.7	25.8	35.3	0.35
213A-4	U	0.251	73	0.574	100	1	9.5	5550	2.5	2.3	4.6	21.7	31.1	0.31
OFF1A-2	U	0.378	74	0.591	100	1	9.2	6500	3.4	2.7	5.4	21.5	30.7	0.31
OFF1A-3	U	0.302	74	0.581	100	1	9.3	7150	2.7	2.4	4.8	26.4	35.7	0.36
OFF1A-4	U	0.274	73	0.575	100	1	9.5	6400	2.8	2.5	4.9	23.4	32.8	0.33
213A-6	U	0.279	73	0.574	100	1	9.5	5550	1.3	1.7	3.4	30.0	39.5	0.40
213A-7	U	0.251	73	0.574	100	1	9.5	5500	2.3	2.2	4.5	22.4	31.9	0.32
213A-8	U	0.255	73	0.574	100	1	9.5	5450	2.2	2.2	4.4	22.7	32.2	0.32
213A-9	U	0.252	73	0.574	100	1	9.5	5300	1	1.5	2.9	32.8	42.3	0.42
213A-10	U	0.252	73	0.572	100	1	9.5	5500	2.2	2.2	4.4	22.9	32.4	0.32
213A-11	U	0.256	73	0.573	100	1	9.5	5500	2.3	2.2	4.5	22.4	31.9	0.32
213B-1	U	0.261	73	0.573	100	1	9.5	5500	2.3	2.2	4.5	22.4	31.9	0.32
213B-2	U	0.262	73	0.574	100	1	9.5	5600	2.4	2.3	4.6	22.3	31.8	0.32
213B-3	U	0.253	73	0.574	100	1	9.5	5400	2.3	2.2	4.5	22.0	31.5	0.32
213B-4	U	0.255	73	0.574	100	1	9.5	5500	2.1	2.1	4.3	23.4	32.9	0.33
213B-5	U	0.240	73	0.574	100	1	9.5	4900	1.3	1.7	3.4	26.8	36.3	0.36
213B-6	U	0.244	73	0.574	100	1	9.5	5350	2.1	2.1	4.3	22.9	32.3	0.32
213B-7	U	0.249	73	0.574	100	1	9.5	5200	1.2	1.6	3.2	29.5	38.9	0.39
223A-2	D	0.384	88	0.772	100	1	5.9	4750	2.2	3.0	4.5	18.4	24.3	0.24
223A-3	U	0.250	73	0.574	100	1	9.5	5400	2	2.1	4.2	23.6	33.1	0.33
223B-2	D	0.191	86	0.745	100	1	6.4	3450	1.7	2.6	4.0	15.5	21.9	0.22
223B-3	D	0.257	87	0.758	100	1	6.1	5500	1.6	2.6	3.9	24.8	30.9	0.31
223B-4	D	0.244	88	0.772	100	1	5.9	5400	1.8	2.7	4.1	23.0	28.9	0.29
223B-5	D	0.252	88	0.772	100	1	5.9	5450	1.5	2.5	3.7	25.4	31.3	0.31
223B-6	U	0.192	79	0.653	100	1	8.0	4600	0.9	1.4	2.8	30.4	38.5	0.38
223B-7	D	0.230	88	0.772	100	1	5.9	3800	2	2.9	4.3	15.6	21.5	0.22
223C-1	D	0.266	88	0.772	100	1	5.9	5600	1.7	2.6	4.0	24.5	30.4	0.30
223C-2	D	0.273	88	0.772	100	1	5.9	5650	1.8	2.7	4.1	24.0	29.9	0.30

Subbasin Data					Overland Time (t_i)			Travel Time (t_t)					Totals	
Subbasin ID	Developed/	Area	CN	K	Length	Slope	t_i	Length	Slope	Velocity (fps)		t_t	t_c	Lag Time
	Undeveloped	(mi^2)			(ft)	(%)	(min)	(ft)	(%)	V_1	V_2	(min)	(min)	(hours)
223C-3	D	0.273	88	0.772	100	1	5.9	5650	1.8	2.7	4.1	24.0	29.9	0.30
223C-4	D	0.262	78	0.640	100	1	8.3	5600	0.9	1.9	2.9	33.6	41.9	0.42
223C-5	U	0.219	73	0.574	100	1	9.5	3100	2.5	2.3	4.6	12.9	22.4	0.22
223C-6	U	0.249	73	0.574	100	1	9.5	5400	1.8	2.0	3.9	24.9	34.4	0.34
223C-7	U	0.250	73	0.574	100	1	9.5	5350	1.7	1.9	3.8	25.4	34.9	0.35
223C-8	U	0.251	73	0.574	100	1	9.5	5450	1.7	1.9	3.8	25.8	35.3	0.35
223C-9	D	0.313	81	0.679	100	1	7.6	6000	1.3	2.3	3.5	29.9	37.5	0.37
223C-10	U	0.241	73	0.574	100	1	9.5	3900	2.4	2.3	4.6	16.1	25.6	0.26
223C-11	U	0.250	73	0.574	100	1	9.5	5400	1.9	2.0	4.1	24.2	33.7	0.34
223C-12	U	0.251	73	0.574	100	1	9.5	5500	2	2.1	4.2	24.0	33.5	0.33
223C-13	D	0.247	88	0.772	100	1	5.9	5350	1.9	2.8	4.2	22.2	28.1	0.28
223C-14	D	0.375	83	0.706	100	1	7.1	6700	1.3	2.3	3.5	33.2	40.3	0.40
223C-15	U	0.251	73	0.574	100	1	9.5	4100	2.4	2.3	4.6	16.8	26.3	0.26
223C-16	U	0.251	73	0.574	100	1	9.5	5400	1.9	2.0	4.1	24.2	33.7	0.34
223C-17	D	0.248	88	0.772	100	1	5.9	5400	1.7	2.6	4.0	23.6	29.5	0.30
223C-18	D	0.258	88	0.772	100	1	5.9	5500	1.7	2.6	4.0	24.1	30.0	0.30
223C-19	D	0.373	83	0.706	100	1	7.1	6400	1.2	2.2	3.4	33.1	40.2	0.40
223C-20	U	0.265	73	0.574	100	1	9.5	4150	2.5	2.3	4.6	16.6	26.1	0.26
223C-21	D	0.252	88	0.772	100	1	5.9	5400	1.8	2.7	4.1	23.0	28.9	0.29
223C-22	D	0.262	88	0.772	100	1	5.9	5500	1.5	2.5	3.7	25.6	31.5	0.32
223C-23	D	0.253	85	0.732	100	1	6.6	5400	1.5	2.5	3.7	25.2	31.8	0.32
223C-24	D	0.315	83	0.706	100	1	7.1	6850	1.2	2.2	3.4	35.3	42.4	0.42
NW1-C	U	0.293	81	0.676	100	1	7.6	6400	3.4	2.7	5.4	21.2	28.8	0.29
NW2-C	U	0.395	73	0.574	100	1	9.5	7300	2.2	2.2	4.4	29.8	39.3	0.39
NW5-C	U	0.275	73	0.574	100	1	9.5	5650	2.1	2.1	4.3	24.0	33.5	0.34
NW7-C	U	0.488	84	0.720	100	1	6.8	9700	3.2	2.6	5.3	32.3	39.1	0.39
NW9-C	U	0.273	73	0.574	100	1	9.5	6200	2.3	2.2	4.5	25.0	34.5	0.34
NW11-C	U	0.270	73	0.574	100	1	9.5	5600	2.6	2.4	4.7	21.4	30.9	0.31
NW17-C	U	0.430	73	0.574	100	1	9.5	7750	2.2	2.2	4.4	31.5	41.0	0.41
NW21-C	U	0.403	84	0.723	100	1	6.8	7850	3.1	2.6	5.2	26.9	33.6	0.34
NW23-C	U	0.376	73	0.574	100	1	9.5	6900	2.1	2.1	4.3	28.9	38.4	0.38
NW33-C	U	0.248	86	0.745	100	1	6.4	5400	2.8	2.5	4.9	20.0	26.4	0.26
NW35-C	U	0.434	83	0.710	100	1	7.0	5100	3.5	2.8	5.5	16.9	24.0	0.24
NW50-C	U	0.358	73	0.574	100	1	9.5	6300	3.3	2.7	5.3	21.2	30.7	0.31

Subbasin Data					Overland Time (t_i)			Travel Time (t_t)					Totals	
Subbasin ID	Developed/	Area	CN	K	Length	Slope	t_i	Length	Slope	Velocity (fps)		t_t	t_c	Lag Time
	Undeveloped	(mi^2)			(ft)	(%)	(min)	(ft)	(%)	V_1	V_2	(min)	(min)	(hours)
NW51-C	U	0.306	73	0.574	100	1	9.5	5100	3.2	2.6	5.3	17.7	27.2	0.27
NW64-C	U	0.407	73	0.574	100	1	9.5	7500	2.8	2.5	4.9	27.1	36.6	0.37
NW102-C	U	0.412	73	0.574	100	1	9.5	8600	2.2	2.2	4.4	34.8	44.2	0.44
NW130-C	U	0.241	75	0.606	100	1	8.9	6550	1.5	1.8	3.6	32.6	41.5	0.42
OFF1A-5	U	0.418	73	0.574	100	1	9.5	7650	2.5	2.3	4.6	29.2	38.7	0.39
OFF1A-6	U	0.473	73	0.574	500	10	9.8	8300	3.5	2.8	5.5	26.6	36.5	0.36
OFF2A	U	0.318	73	0.574	100	1	9.5	6200	2.5	2.3	4.6	24.0	33.5	0.33
OFF2B	U	0.160	73	0.574	500	10	9.8	3700	3.5	2.8	5.5	12.7	22.5	0.23
OFF3	U	0.222	73	0.574	100	1	9.5	5200	2.4	2.3	4.6	20.8	30.3	0.30
OFF4-1	U	0.301	77	0.628	100	1	8.5	10400	6.2	3.7	7.3	24.8	33.3	0.33
OFF4-2	U	0.420	79	0.659	100	1	7.9	4600	12.7	5.3	10.5	8.1	16.0	0.16
OFF5-1	U	0.297	80	0.672	100	1	7.7	6700	6	3.6	7.2	16.6	24.4	0.24
OFF5-2	U	0.395	86	0.742	100	1	6.4	10000	4.8	3.2	6.4	27.2	33.6	0.34
OFF8	U	0.272	86	0.745	500	10	6.6	6500	3.9	2.9	5.8	20.1	26.7	0.27
OFF9	U	0.303	86	0.745	500	10	6.6	11100	4	3.0	5.9	32.9	39.5	0.39

Alternative E

Subbasin ID	Non-Disposal (ac)	Disposal (ac)	Out of CTA (ac)	CN_{NONDIS}	CN_{DIS}	CN_E
NW187-C	0	161	4	80	91	91
116-13	42	133	1	72	88	84
116-14	176	145	13	73	88	80
223C-21	0	159	2	73	88	88
223C-22	0	164	3	73	88	88
223C-23	0	123	38	73	88	85
223C-24	0	197	5	77	90	89
125A-15	88	43	11	75	90	80
125A-16	154	40	6	76	90	79
116-7	0	34	165	73	89	76
223C-17	0	155	4	73	88	88
223C-18	0	165	0	73	88	88
223C-19	34	205	0	76	89	88
125A-12	142	4	0	76	90	77
223C-13	0	154	4	73	88	88
125A-14	59	195	29	73	89	84
223C-14	75	166	0	75	89	85
125A-13	155	182	0	74	89	82
125A-10	101	52	0	74	89	79
125A-11	25	136	0	74	89	87
223C-9	36	160	5	73	88	85
125A-6	49	58	0	73	89	81
125A-7	75	171	0	73	88	84
125A-8	0	210	0	73	88	88
125A-9	0	208	1	73	88	88
125B-3	0	273	0	73	88	88
125B-4	0	245	86	73	88	84
223B-7	0	147	0	73	88	88
223C-1	0	170	0	73	88	88
223C-2	0	175	0	73	88	88
223C-3	0	172	3	73	88	88
223C-4	42	111	15	73	88	83
223A-2	0	246	0	73	88	88
125A-5	0	195	0	73	88	88
125A-4	0	203	0	73	88	88
125A-3	0	224	0	73	88	88
125A-1	66	183	0	73	88	84
125A-2	0	217	0	73	88	88
125B-1	0	197	0	73	88	88
125B-2	0	154	52	73	88	84
223B-2	0	107	15	73	88	86
223B-3	0	155	10	73	88	87
223B-4	0	152	4	73	88	88
223B-5	0	160	2	73	88	88
223B-6	60	64	0	73	88	81
102B	230	1837	3623	83	92	86
102A	174	451	3390	83	92	84
SOUTH	1523	1097	6899	80	91	81

Upper Las Vegas Wash
SCS Lag Time Calculations for Alternative E

Subbasin Data					Overland Time (t_i)			Travel Time (t_t)					Totals	
Subbasin ID	Developed/	Area	CN	K	Length	Slope	t_i	Length	Slope	Velocity (fps)		t_t	t_c	Lag Time
	Undeveloped	(mi^2)			(ft)	(%)	(min)	(ft)	(%)	V_1	V_2	(min)	(min)	(hours)
116-2	U	0.415	73	0.567	100	1	9.6	8150	1.3	1.7	3.4	43.0	52.6	0.53
116-3	U	0.403	72	0.561	100	1	9.7	7000	2.6	2.4	4.7	26.3	36.1	0.36
116-4	U	0.417	72	0.560	100	1	9.7	7100	3.5	2.8	5.5	23.0	32.7	0.33
116-5	U	0.418	73	0.576	100	1	9.4	7100	3.9	2.9	5.8	21.8	31.2	0.31
116-6	U	0.413	72	0.560	100	1	9.7	7150	4.7	3.2	6.4	20.0	29.7	0.30
116-9	U	0.271	75	0.605	100	1	8.9	5400	0.3	0.8	1.6	61.0	69.9	0.70
116-10	U	0.271	75	0.597	100	1	9.1	5000	1.7	1.9	3.8	23.9	32.9	0.33
116-11	U	0.270	72	0.563	100	1	9.7	5600	2	2.1	4.2	24.4	34.1	0.34
116-12	U	0.265	72	0.560	100	1	9.7	5550	2.6	2.4	4.7	21.2	31.0	0.31
116-13	D	0.273	84	0.719	100	1	6.9	5700	0.5	1.4	2.2	45.9	52.7	0.53
116-14	D	0.293	80	0.666	100	1	7.8	5100	1	2.0	3.1	29.2	37.0	0.37
NW187-C	D	0.259	91	0.811	100	1	5.2	7150	0.6	1.6	2.4	52.1	57.3	0.57
116-1	U	0.402	73	0.573	100	1	9.5	7100	1.1	1.6	3.1	41.0	50.5	0.51
116-7	U	0.311	76	0.613	100	1	8.8	6000	0.7	1.2	2.5	44.0	52.8	0.53
116-8	U	0.328	74	0.580	100	1	9.4	6150	0.6	1.1	2.3	48.6	58.0	0.58
125A-5	D	0.234	88	0.772	100	1	5.9	5200	2.5	3.2	4.8	18.8	24.7	0.25
125A-8	D	0.328	88	0.772	100	1	5.9	3500	3.1	3.6	5.4	11.6	17.5	0.18
125A-9	D	0.326	88	0.772	100	1	5.9	3500	3.9	4.0	6.0	10.4	16.3	0.16
125A-10	D	0.239	79	0.653	100	1	8.0	5000	1.1	2.1	3.2	27.3	35.4	0.35
125A-11	D	0.253	87	0.758	100	1	6.1	5450	1.2	2.2	3.4	28.4	34.5	0.35
125A-12	D	0.225	77	0.626	100	1	8.5	4900	0.9	1.9	2.9	29.6	38.1	0.38
125A-13	D	0.519	82	0.692	100	1	7.3	8000	0.9	1.9	2.9	47.4	54.7	0.55
125A-14	D	0.443	84	0.719	100	1	6.9	6700	1.2	2.2	3.4	34.6	41.5	0.41
125A-15	U	0.219	80	0.666	100	1	7.8	4800	1	1.5	2.9	30.0	37.8	0.38
125A-16	U	0.312	79	0.653	100	1	8.0	6650	0.7	1.2	2.5	48.4	56.4	0.56
125B-1	D	0.274	88	0.772	100	1	5.9	5100	2.9	3.4	5.2	17.1	23.0	0.23
125B-2	D	0.293	84	0.719	100	1	6.9	5100	2.8	3.4	5.1	17.4	24.3	0.24
125B-3	D	0.425	88	0.772	100	1	5.9	6950	2.6	3.3	4.9	24.3	30.3	0.30
125B-4	D	0.517	84	0.719	100	1	6.9	7950	2.6	3.3	4.9	27.7	34.6	0.35
125A-1	D	0.278	84	0.719	100	1	6.9	5200	1.8	2.7	4.1	22.2	29.0	0.29

Subbasin Data					Overland Time (t_i)			Travel Time (t_t)					Totals	
Subbasin ID	Developed/	Area	CN	K	Length	Slope	t_i	Length	Slope	Velocity (fps)		t_t	t_c	Lag Time
	Undeveloped	(mi^2)			(ft)	(%)	(min)	(ft)	(%)	V_1	V_2	(min)	(min)	(hours)
125A-2	D	0.269	88	0.772	100	1	5.9	5550	2.5	3.2	4.8	20.0	25.9	0.26
125A-3	D	0.270	88	0.772	100	1	5.9	5550	2.3	3.1	4.6	20.9	26.8	0.27
125A-4	D	0.246	88	0.772	100	1	5.9	5050	2.3	3.1	4.6	19.1	25.0	0.25
125A-6	D	0.165	81	0.679	100	1	7.6	3800	2.1	2.9	4.4	15.2	22.8	0.23
125A-7	D	0.382	84	0.719	100	1	6.9	5000	2.7	3.3	5.0	17.4	24.3	0.24
213A-2	U	0.500	73	0.574	500	10	9.8	8100	3	2.6	5.1	28.1	38.0	0.38
213A-3	U	0.371	73	0.574	100	1	9.5	6850	2.6	2.4	4.7	25.8	35.3	0.35
213A-4	U	0.251	73	0.574	100	1	9.5	5550	2.5	2.3	4.6	21.7	31.1	0.31
OFF1A-2	U	0.378	74	0.591	100	1	9.2	6500	3.4	2.7	5.4	21.5	30.7	0.31
OFF1A-3	U	0.302	74	0.581	100	1	9.3	7150	2.7	2.4	4.8	26.4	35.7	0.36
OFF1A-4	U	0.274	73	0.575	100	1	9.5	6400	2.8	2.5	4.9	23.4	32.8	0.33
213A-6	U	0.279	73	0.574	100	1	9.5	5550	1.3	1.7	3.4	30.0	39.5	0.40
213A-7	U	0.251	73	0.574	100	1	9.5	5500	2.3	2.2	4.5	22.4	31.9	0.32
213A-8	U	0.255	88	0.772	100	1	5.9	5450	2.2	2.2	4.4	22.7	28.6	0.29
213A-9	U	0.252	88	0.772	100	1	5.9	5300	1	1.5	2.9	32.8	38.8	0.39
213A-10	U	0.252	73	0.572	100	1	9.5	5500	2.2	2.2	4.4	22.9	32.4	0.32
213A-11	U	0.256	73	0.573	100	1	9.5	5500	2.3	2.2	4.5	22.4	31.9	0.32
213B-1	U	0.261	73	0.573	100	1	9.5	5500	2.3	2.2	4.5	22.4	31.9	0.32
213B-2	U	0.262	73	0.574	100	1	9.5	5600	2.4	2.3	4.6	22.3	31.8	0.32
213B-3	U	0.253	73	0.574	100	1	9.5	5400	2.3	2.2	4.5	22.0	31.5	0.32
213B-4	U	0.255	73	0.574	100	1	9.5	5500	2.1	2.1	4.3	23.4	32.9	0.33
213B-5	U	0.240	73	0.574	100	1	9.5	4900	1.3	1.7	3.4	26.8	36.3	0.36
213B-6	U	0.244	73	0.574	100	1	9.5	5350	2.1	2.1	4.3	22.9	32.3	0.32
213B-7	U	0.249	73	0.574	100	1	9.5	5200	1.2	1.6	3.2	29.5	38.9	0.39
223A-2	D	0.384	88	0.772	100	1	5.9	4750	2.2	3.0	4.5	18.4	24.3	0.24
223A-3	U	0.250	73	0.574	100	1	9.5	5400	2	2.1	4.2	23.6	33.1	0.33
223B-2	D	0.191	86	0.745	100	1	6.4	3450	1.7	2.6	4.0	15.5	21.9	0.22
223B-3	D	0.257	87	0.758	100	1	6.1	5500	1.6	2.6	3.9	24.8	30.9	0.31
223B-4	D	0.244	88	0.772	100	1	5.9	5400	1.8	2.7	4.1	23.0	28.9	0.29
223B-5	D	0.252	88	0.772	100	1	5.9	5450	1.5	2.5	3.7	25.4	31.3	0.31
223B-6	D	0.192	81	0.679	100	1	7.6	4600	0.9	1.9	2.9	27.9	35.5	0.35
223B-7	D	0.230	88	0.772	100	1	5.9	3800	2	2.9	4.3	15.6	21.5	0.22
223C-1	D	0.266	88	0.772	100	1	5.9	5600	1.7	2.6	4.0	24.5	30.4	0.30
223C-2	D	0.273	88	0.772	100	1	5.9	5650	1.8	2.7	4.1	24.0	29.9	0.30

Subbasin Data					Overland Time (t_i)			Travel Time (t_t)					Totals	
Subbasin ID	Developed/	Area	CN	K	Length	Slope	t_i	Length	Slope	Velocity (fps)		t_t	t_c	Lag Time
	Undeveloped	(mi^2)			(ft)	(%)	(min)	(ft)	(%)	V_1	V_2	(min)	(min)	(hours)
223C-3	D	0.273	88	0.772	100	1	5.9	5650	1.8	2.7	4.1	24.0	29.9	0.30
223C-4	D	0.262	83	0.706	100	1	7.1	5600	0.9	1.9	2.9	33.6	40.7	0.41
223C-5	U	0.219	73	0.574	100	1	9.5	3100	2.5	2.3	4.6	12.9	22.4	0.22
223C-6	U	0.249	73	0.574	100	1	9.5	5400	1.8	2.0	3.9	24.9	34.4	0.34
223C-7	U	0.250	73	0.574	100	1	9.5	5350	1.7	1.9	3.8	25.4	34.9	0.35
223C-8	U	0.251	73	0.574	100	1	9.5	5450	1.7	1.9	3.8	25.8	35.3	0.35
223C-9	D	0.313	85	0.732	100	1	6.6	6000	1.3	2.3	3.5	29.9	36.5	0.37
223C-10	U	0.241	73	0.574	100	1	9.5	3900	2.4	2.3	4.6	16.1	25.6	0.26
223C-11	U	0.250	73	0.574	100	1	9.5	5400	1.9	2.0	4.1	24.2	33.7	0.34
223C-12	U	0.251	73	0.574	100	1	9.5	5500	2	2.1	4.2	24.0	33.5	0.33
223C-13	D	0.247	88	0.772	100	1	5.9	5350	1.9	2.8	4.2	22.2	28.1	0.28
223C-14	D	0.375	85	0.732	100	1	6.6	6700	1.3	2.3	3.5	33.2	39.9	0.40
223C-15	U	0.251	73	0.574	100	1	9.5	4100	2.4	2.3	4.6	16.8	26.3	0.26
223C-16	U	0.251	73	0.574	100	1	9.5	5400	1.9	2.0	4.1	24.2	33.7	0.34
223C-17	D	0.248	88	0.772	100	1	5.9	5400	1.7	2.6	4.0	23.6	29.5	0.30
223C-18	D	0.258	88	0.772	100	1	5.9	5500	1.7	2.6	4.0	24.1	30.0	0.30
223C-19	D	0.373	88	0.772	100	1	5.9	6400	1.2	2.2	3.4	33.1	39.0	0.39
223C-20	U	0.265	73	0.574	100	1	9.5	4150	2.5	2.3	4.6	16.6	26.1	0.26
223C-21	D	0.252	88	0.772	100	1	5.9	5400	1.8	2.7	4.1	23.0	28.9	0.29
223C-22	D	0.262	88	0.772	100	1	5.9	5500	1.5	2.5	3.7	25.6	31.5	0.32
223C-23	D	0.253	85	0.732	100	1	6.6	5400	1.5	2.5	3.7	25.2	31.8	0.32
223C-24	D	0.315	89	0.785	100	1	5.7	6850	1.2	2.2	3.4	35.3	41.0	0.41
NW1-C	U	0.293	81	0.676	100	1	7.6	6400	3.4	2.7	5.4	21.2	28.8	0.29
NW2-C	U	0.395	73	0.574	100	1	9.5	7300	2.2	2.2	4.4	29.8	39.3	0.39
NW5-C	U	0.275	73	0.574	100	1	9.5	5650	2.1	2.1	4.3	24.0	33.5	0.34
NW7-C	U	0.488	84	0.720	100	1	6.8	9700	3.2	2.6	5.3	32.3	39.1	0.39
NW9-C	U	0.273	73	0.574	100	1	9.5	6200	2.3	2.2	4.5	25.0	34.5	0.34
NW11-C	U	0.270	73	0.574	100	1	9.5	5600	2.6	2.4	4.7	21.4	30.9	0.31
NW17-C	U	0.430	73	0.574	100	1	9.5	7750	2.2	2.2	4.4	31.5	41.0	0.41
NW21-C	U	0.403	84	0.723	100	1	6.8	7850	3.1	2.6	5.2	26.9	33.6	0.34
NW23-C	U	0.376	73	0.574	100	1	9.5	6900	2.1	2.1	4.3	28.9	38.4	0.38
NW33-C	U	0.248	86	0.745	100	1	6.4	5400	2.8	2.5	4.9	20.0	26.4	0.26
NW35-C	U	0.434	83	0.710	100	1	7.0	5100	3.5	2.8	5.5	16.9	24.0	0.24
NW50-C	U	0.358	73	0.574	100	1	9.5	6300	3.3	2.7	5.3	21.2	30.7	0.31

Subbasin Data					Overland Time (t_i)			Travel Time (t_t)					Totals	
Subbasin ID	**Developed/**	**Area**	**CN**	**K**	**Length**	**Slope**	**t_i**	**Length**	**Slope**	**Velocity (fps)**		**t_t**	**t_c**	**Lag Time**
	Undeveloped	**(mi^2)**			**(ft)**	**(%)**	**(min)**	**(ft)**	**(%)**	**V_1**	**V_2**	**(min)**	**(min)**	**(hours)**
NW51-C	U	0.306	73	0.574	100	1	9.5	5100	3.2	2.6	5.3	17.7	27.2	0.27
NW64-C	U	0.407	73	0.574	100	1	9.5	7500	2.8	2.5	4.9	27.1	36.6	0.37
NW102-C	U	0.412	73	0.574	100	1	9.5	8600	2.2	2.2	4.4	34.8	44.2	0.44
NW130-C	U	0.241	75	0.606	100	1	8.9	6550	1.5	1.8	3.6	32.6	41.5	0.42
OFF1A-5	U	0.418	73	0.574	100	1	9.5	7650	2.5	2.3	4.6	29.2	38.7	0.39
OFF1A-6	U	0.473	73	0.574	500	10	9.8	8300	3.5	2.8	5.5	26.6	36.5	0.36
OFF2A	U	0.318	73	0.574	100	1	9.5	6200	2.5	2.3	4.6	24.0	33.5	0.33
OFF2B	U	0.160	73	0.574	500	10	9.8	3700	3.5	2.8	5.5	12.7	22.5	0.23
OFF3	U	0.222	73	0.574	100	1	9.5	5200	2.4	2.3	4.6	20.8	30.3	0.30
OFF4-1	U	0.301	77	0.628	100	1	8.5	10400	6.2	3.7	7.3	24.8	33.3	0.33
OFF4-2	U	0.420	79	0.659	100	1	7.9	4600	12.7	5.3	10.5	8.1	16.0	0.16
OFF5-1	U	0.297	80	0.672	100	1	7.7	6700	6	3.6	7.2	16.6	24.4	0.24
OFF5-2	U	0.395	86	0.742	100	1	6.4	10000	4.8	3.2	6.4	27.2	33.6	0.34
OFF8	U	0.272	86	0.745	500	10	6.6	6500	3.9	2.9	5.8	20.1	26.7	0.27
OFF9	U	0.303	86	0.745	500	10	6.6	11100	4	3.0	5.9	32.9	39.5	0.39

No-Action Alternative

Subbasin ID	Non-Disposal (ac)	Disposal (ac)	Out of CTA (ac)	CN_{NONDIS}	CN_{DIS}	CN_{NOA}
NW187-C	0	161	4	80	91	91
116-13	0	174	1	72	88	88
116-14	0	322	13	73	88	88
223C-21	0	159	2	73	88	88
223C-22	0	164	3	73	88	88
223C-23	0	123	38	73	88	85
223C-24	0	197	5	77	90	89
125A-15	0	131	11	75	90	88
125A-16	0	194	6	76	90	89
116-7	0	34	165	73	89	76
223C-17	0	155	4	73	88	88
223C-18	0	165	0	73	88	88
223C-19	0	239	0	76	89	89
125A-12	0	145	0	76	90	90
223C-13	0	154	4	73	88	88
125A-14	0	255	29	73	89	87
223C-14	0	241	0	75	89	89
125A-13	0	337	0	74	89	89
125A-10	0	153	0	74	89	89
125A-11	0	161	0	74	89	89
223C-9	0	196	5	73	88	88
125A-6	0	106	0	73	89	89
125A-7	0	245	0	73	88	88
125A-8	0	210	0	73	88	88
125A-9	0	208	1	73	88	88
125B-3	0	273	0	73	88	88
125B-4	0	245	86	73	88	84
223B-7	0	147	0	73	88	88
223C-1	0	170	0	73	88	88
223C-2	0	175	0	73	88	88
223C-3	0	172	3	73	88	88
223C-4	0	153	15	73	88	87
223A-2	0	246	0	73	88	88
125A-5	0	195	0	73	88	88
125A-4	0	203	0	73	88	88
125A-3	0	224	0	73	88	88
125A-1	0	249	0	73	88	88
125A-2	0	217	0	73	88	88
125B-1	0	197	0	73	88	88
125B-2	0	154	52	73	88	84
223B-2	0	107	15	73	88	86
223B-3	0	155	10	73	88	87
223B-4	0	152	4	73	88	88
223B-5	0	160	2	73	88	88
223B-6	0	123	0	73	88	88
102B	192	1875	3623	83	92	86
102A	174	451	3390	83	92	84
SOUTH	1057	1564	6899	80	91	82

Upper Las Vegas Wash
SCS Lag Time Calculations for No-Action Alternative

Subbasin Data					Overland Time (t_i)			Travel Time (t_t)					Totals	
Subbasin ID	Developed/	Area	CN	K	Length	Slope	t_i	Length	Slope	Velocity (fps)		t_t	t_c	Lag Time
	Undeveloped	(mi^2)			(ft)	(%)	(min)	(ft)	(%)	V_1	V_2	(min)	(min)	(hours)
116-2	U	0.415	73	0.567	100	1	9.6	8150	1.3	1.7	3.4	43.0	52.6	0.53
116-3	U	0.403	72	0.561	100	1	9.7	7000	2.6	2.4	4.7	26.3	36.1	0.36
116-4	U	0.417	72	0.560	100	1	9.7	7100	3.5	2.8	5.5	23.0	32.7	0.33
116-5	U	0.418	73	0.576	100	1	9.4	7100	3.9	2.9	5.8	21.8	31.2	0.31
116-6	U	0.413	72	0.560	100	1	9.7	7150	4.7	3.2	6.4	20.0	29.7	0.30
116-9	U	0.271	75	0.605	100	1	8.9	5400	0.3	0.8	1.6	61.0	69.9	0.70
116-10	U	0.271	75	0.597	100	1	9.1	5000	1.7	1.9	3.8	23.9	32.9	0.33
116-11	U	0.270	72	0.563	100	1	9.7	5600	2	2.1	4.2	24.4	34.1	0.34
116-12	U	0.265	72	0.560	100	1	9.7	5550	2.6	2.4	4.7	21.2	31.0	0.31
116-13	D	0.273	88	0.772	100	1	5.9	5700	0.5	1.4	2.2	45.9	51.8	0.52
116-14	U	0.293	88	0.772	100	1	5.9	5100	1	1.5	2.9	31.7	37.6	0.38
NW187-C	D	0.259	91	0.811	100	1	5.2	7150	0.6	1.6	2.4	52.1	57.3	0.57
116-1	U	0.402	73	0.573	100	1	9.5	7100	1.1	1.6	3.1	41.0	50.5	0.51
116-7	U	0.311	76	0.613	100	1	8.8	6000	0.7	1.2	2.5	44.0	52.8	0.53
116-8	U	0.328	74	0.580	100	1	9.4	6150	0.6	1.1	2.3	48.6	58.0	0.58
125A-5	D	0.234	88	0.772	100	1	5.9	5200	2.5	3.2	4.8	18.8	24.7	0.25
125A-8	D	0.328	88	0.772	100	1	5.9	3500	3.1	3.6	5.4	11.6	17.5	0.18
125A-9	D	0.326	88	0.772	100	1	5.9	3500	3.9	4.0	6.0	10.4	16.3	0.16
125A-10	D	0.239	89	0.785	100	1	5.7	5000	1.1	2.1	3.2	27.3	33.0	0.33
125A-11	D	0.253	89	0.785	100	1	5.7	5450	1.2	2.2	3.4	28.4	34.1	0.34
125A-12	D	0.225	90	0.798	100	1	5.4	4900	0.9	1.9	2.9	29.6	35.0	0.35
125A-13	D	0.519	89	0.785	100	1	5.7	8000	0.9	1.9	2.9	47.4	53.1	0.53
125A-14	D	0.443	87	0.758	100	1	6.1	6700	1.2	2.2	3.4	34.6	40.7	0.41
125A-15	D	0.219	88	0.772	100	1	5.9	4800	1	2.0	3.1	27.5	33.5	0.33
125A-16	D	0.312	89	0.785	100	1	5.7	6650	0.7	1.7	2.6	45.0	50.6	0.51
125B-1	D	0.274	88	0.772	100	1	5.9	5100	2.9	3.4	5.2	17.1	23.0	0.23
125B-2	D	0.293	84	0.719	100	1	6.9	5100	2.8	3.4	5.1	17.4	24.3	0.24
125B-3	D	0.425	88	0.772	100	1	5.9	6950	2.6	3.3	4.9	24.3	30.3	0.30
125B-4	D	0.517	84	0.719	100	1	6.9	7950	2.6	3.3	4.9	27.7	34.6	0.35
125A-1	D	0.278	88	0.772	100	1	5.9	5200	1.8	2.7	4.1	22.2	28.1	0.28

Subbasin Data					Overland Time (t_i)			Travel Time (t_t)					Totals	
Subbasin ID	Developed/	Area	CN	K	Length	Slope	t_i	Length	Slope	Velocity (fps)		t_t	t_c	Lag Time
	Undeveloped	(mi^2)			(ft)	(%)	(min)	(ft)	(%)	V_1	V_2	(min)	(min)	(hours)
125A-2	D	0.269	88	0.772	100	1	5.9	5550	2.5	3.2	4.8	20.0	25.9	0.26
125A-3	D	0.270	88	0.772	100	1	5.9	5550	2.3	3.1	4.6	20.9	26.8	0.27
125A-4	D	0.246	88	0.772	100	1	5.9	5050	2.3	3.1	4.6	19.1	25.0	0.25
125A-6	D	0.165	89	0.785	100	1	5.7	3800	2.1	2.9	4.4	15.2	20.9	0.21
125A-7	D	0.382	88	0.772	100	1	5.9	5000	2.7	3.3	5.0	17.4	23.3	0.23
213A-2	U	0.500	73	0.574	500	10	9.8	8100	3	2.6	5.1	28.1	38.0	0.38
213A-3	U	0.371	73	0.574	100	1	9.5	6850	2.6	2.4	4.7	25.8	35.3	0.35
213A-4	U	0.251	73	0.574	100	1	9.5	5550	2.5	2.3	4.6	21.7	31.1	0.31
OFF1A-2	U	0.378	74	0.591	100	1	9.2	6500	3.4	2.7	5.4	21.5	30.7	0.31
OFF1A-3	U	0.302	74	0.581	100	1	9.3	7150	2.7	2.4	4.8	26.4	35.7	0.36
OFF1A-4	U	0.274	73	0.575	100	1	9.5	6400	2.8	2.5	4.9	23.4	32.8	0.33
213A-6	U	0.279	73	0.574	100	1	9.5	5550	1.3	1.7	3.4	30.0	39.5	0.40
213A-7	U	0.251	73	0.574	100	1	9.5	5500	2.3	2.2	4.5	22.4	31.9	0.32
213A-8	U	0.255	73	0.574	100	1	9.5	5450	2.2	2.2	4.4	22.7	32.2	0.32
213A-9	U	0.252	73	0.574	100	1	9.5	5300	1	1.5	2.9	32.8	42.3	0.42
213A-10	U	0.252	73	0.572	100	1	9.5	5500	2.2	2.2	4.4	22.9	32.4	0.32
213A-11	U	0.256	73	0.573	100	1	9.5	5500	2.3	2.2	4.5	22.4	31.9	0.32
213B-1	U	0.261	73	0.573	100	1	9.5	5500	2.3	2.2	4.5	22.4	31.9	0.32
213B-2	U	0.262	73	0.574	100	1	9.5	5600	2.4	2.3	4.6	22.3	31.8	0.32
213B-3	U	0.253	73	0.574	100	1	9.5	5400	2.3	2.2	4.5	22.0	31.5	0.32
213B-4	U	0.255	73	0.574	100	1	9.5	5500	2.1	2.1	4.3	23.4	32.9	0.33
213B-5	U	0.240	73	0.574	100	1	9.5	4900	1.3	1.7	3.4	26.8	36.3	0.36
213B-6	U	0.244	73	0.574	100	1	9.5	5350	2.1	2.1	4.3	22.9	32.3	0.32
213B-7	U	0.249	73	0.574	100	1	9.5	5200	1.2	1.6	3.2	29.5	38.9	0.39
223A-2	D	0.384	88	0.772	100	1	5.9	4750	2.2	3.0	4.5	18.4	24.3	0.24
223A-3	U	0.250	73	0.574	100	1	9.5	5400	2	2.1	4.2	23.6	33.1	0.33
223B-2	D	0.191	86	0.745	100	1	6.4	3450	1.7	2.6	4.0	15.5	21.9	0.22
223B-3	D	0.257	87	0.758	100	1	6.1	5500	1.6	2.6	3.9	24.8	30.9	0.31
223B-4	D	0.244	88	0.772	100	1	5.9	5400	1.8	2.7	4.1	23.0	28.9	0.29
223B-5	D	0.252	88	0.772	100	1	5.9	5450	1.5	2.5	3.7	25.4	31.3	0.31
223B-6	D	0.192	88	0.772	100	1	5.9	4600	0.9	1.9	2.9	27.9	33.8	0.34
223B-7	D	0.230	88	0.772	100	1	5.9	3800	2	2.9	4.3	15.6	21.5	0.22
223C-1	D	0.266	88	0.772	100	1	5.9	5600	1.7	2.6	4.0	24.5	30.4	0.30
223C-2	D	0.273	88	0.772	100	1	5.9	5650	1.8	2.7	4.1	24.0	29.9	0.30

Subbasin Data					Overland Time (t_i)			Travel Time (t_t)					Totals	
Subbasin ID	Developed/	Area	CN	K	Length	Slope	t_i	Length	Slope	Velocity (fps)		t_t	t_c	Lag Time
	Undeveloped	(mi^2)			(ft)	(%)	(min)	(ft)	(%)	V_1	V_2	(min)	(min)	(hours)
223C-3	D	0.273	88	0.772	100	1	5.9	5650	1.8	2.7	4.1	24.0	29.9	0.30
223C-4	D	0.262	83	0.706	100	1	7.1	5600	0.9	1.9	2.9	33.6	40.7	0.41
223C-5	U	0.219	73	0.574	100	1	9.5	3100	2.5	2.3	4.6	12.9	22.4	0.22
223C-6	U	0.249	73	0.574	100	1	9.5	5400	1.8	2.0	3.9	24.9	34.4	0.34
223C-7	U	0.250	73	0.574	100	1	9.5	5350	1.7	1.9	3.8	25.4	34.9	0.35
223C-8	U	0.251	73	0.574	100	1	9.5	5450	1.7	1.9	3.8	25.8	35.3	0.35
223C-9	D	0.313	88	0.772	100	1	5.9	6000	1.3	2.3	3.5	29.9	35.8	0.36
223C-10	U	0.241	73	0.574	100	1	9.5	3900	2.4	2.3	4.6	16.1	25.6	0.26
223C-11	U	0.250	73	0.574	100	1	9.5	5400	1.9	2.0	4.1	24.2	33.7	0.34
223C-12	U	0.251	73	0.574	100	1	9.5	5500	2	2.1	4.2	24.0	33.5	0.33
223C-13	D	0.247	88	0.772	100	1	5.9	5350	1.9	2.8	4.2	22.2	28.1	0.28
223C-14	D	0.375	89	0.785	100	1	5.7	6700	1.3	2.3	3.5	33.2	38.9	0.39
223C-15	U	0.251	73	0.574	100	1	9.5	4100	2.4	2.3	4.6	16.8	26.3	0.26
223C-16	U	0.251	73	0.574	100	1	9.5	5400	1.9	2.0	4.1	24.2	33.7	0.34
223C-17	D	0.248	88	0.772	100	1	5.9	5400	1.7	2.6	4.0	23.6	29.5	0.30
223C-18	D	0.258	88	0.772	100	1	5.9	5500	1.7	2.6	4.0	24.1	30.0	0.30
223C-19	D	0.373	89	0.785	100	1	5.7	6400	1.2	2.2	3.4	33.1	38.8	0.39
223C-20	U	0.265	73	0.574	100	1	9.5	4150	2.5	2.3	4.6	16.6	26.1	0.26
223C-21	D	0.252	88	0.772	100	1	5.9	5400	1.8	2.7	4.1	23.0	28.9	0.29
223C-22	D	0.262	88	0.772	100	1	5.9	5500	1.5	2.5	3.7	25.6	31.5	0.32
223C-23	D	0.253	85	0.732	100	1	6.6	5400	1.5	2.5	3.7	25.2	31.8	0.32
223C-24	D	0.315	89	0.785	100	1	5.7	6850	1.2	2.2	3.4	35.3	41.0	0.41
NW1-C	U	0.293	81	0.676	100	1	7.6	6400	3.4	2.7	5.4	21.2	28.8	0.29
NW2-C	U	0.395	73	0.574	100	1	9.5	7300	2.2	2.2	4.4	29.8	39.3	0.39
NW5-C	U	0.275	73	0.574	100	1	9.5	5650	2.1	2.1	4.3	24.0	33.5	0.34
NW7-C	U	0.488	84	0.720	100	1	6.8	9700	3.2	2.6	5.3	32.3	39.1	0.39
NW9-C	U	0.273	73	0.574	100	1	9.5	6200	2.3	2.2	4.5	25.0	34.5	0.34
NW11-C	U	0.270	73	0.574	100	1	9.5	5600	2.6	2.4	4.7	21.4	30.9	0.31
NW17-C	U	0.430	73	0.574	100	1	9.5	7750	2.2	2.2	4.4	31.5	41.0	0.41
NW21-C	U	0.403	84	0.723	100	1	6.8	7850	3.1	2.6	5.2	26.9	33.6	0.34
NW23-C	U	0.376	73	0.574	100	1	9.5	6900	2.1	2.1	4.3	28.9	38.4	0.38
NW33-C	U	0.248	86	0.745	100	1	6.4	5400	2.8	2.5	4.9	20.0	26.4	0.26
NW35-C	U	0.434	83	0.710	100	1	7.0	5100	3.5	2.8	5.5	16.9	24.0	0.24
NW50-C	U	0.358	73	0.574	100	1	9.5	6300	3.3	2.7	5.3	21.2	30.7	0.31

Subbasin Data					Overland Time (t_i)			Travel Time (t_t)					Totals	
Subbasin ID	Developed/	Area	CN	K	Length	Slope	t_i	Length	Slope	Velocity (fps)		t_t	t_c	Lag Time
	Undeveloped	(mi^2)			(ft)	(%)	(min)	(ft)	(%)	V_1	V_2	(min)	(min)	(hours)
NW51-C	U	0.306	73	0.574	100	1	9.5	5100	3.2	2.6	5.3	17.7	27.2	0.27
NW64-C	U	0.407	73	0.574	100	1	9.5	7500	2.8	2.5	4.9	27.1	36.6	0.37
NW102-C	U	0.412	73	0.574	100	1	9.5	8600	2.2	2.2	4.4	34.8	44.2	0.44
NW130-C	U	0.241	75	0.606	100	1	8.9	6550	1.5	1.8	3.6	32.6	41.5	0.42
OFF1A-5	U	0.418	73	0.574	100	1	9.5	7650	2.5	2.3	4.6	29.2	38.7	0.39
OFF1A-6	U	0.473	73	0.574	500	10	9.8	8300	3.5	2.8	5.5	26.6	36.5	0.36
OFF2A	U	0.318	73	0.574	100	1	9.5	6200	2.5	2.3	4.6	24.0	33.5	0.33
OFF2B	U	0.160	73	0.574	500	10	9.8	3700	3.5	2.8	5.5	12.7	22.5	0.23
OFF3	U	0.222	73	0.574	100	1	9.5	5200	2.4	2.3	4.6	20.8	30.3	0.30
OFF4-1	U	0.301	77	0.628	100	1	8.5	10400	6.2	3.7	7.3	24.8	33.3	0.33
OFF4-2	U	0.420	79	0.659	100	1	7.9	4600	12.7	5.3	10.5	8.1	16.0	0.16
OFF5-1	U	0.297	80	0.672	100	1	7.7	6700	6	3.6	7.2	16.6	24.4	0.24
OFF5-2	U	0.395	86	0.742	100	1	6.4	10000	4.8	3.2	6.4	27.2	33.6	0.34
OFF8	U	0.272	86	0.745	500	10	6.6	6500	3.9	2.9	5.8	20.1	26.7	0.27
OFF9	U	0.303	86	0.745	500	10	6.6	11100	4	3.0	5.9	32.9	39.5	0.39

CN and Lag Time Summary for Land Disposal Alternatives

Subbasin ID	CN_{BAS}	LAG_{BAS}	CN_A	LAG_A	CN_B	LAG_B	CN_C	LAG_C	CN_D	LAG_D	CN_E	LAG_E	CN_{NOA}	LAG_{NOA}
		(hr)		(hr)		(hr)		(hr)		(hr)		(hr)		(hr)
116-2	73	0.53	73	0.53	73	0.53	73	0.53	73	0.53	73	0.53	73	0.53
116-3	72	0.36	72	0.36	72	0.36	72	0.36	72	0.36	72	0.36	72	0.36
116-4	72	0.33	72	0.33	72	0.33	72	0.33	72	0.33	72	0.33	72	0.33
116-5	73	0.31	73	0.31	73	0.31	73	0.31	73	0.31	73	0.31	73	0.31
116-6	72	0.30	72	0.30	72	0.30	72	0.30	72	0.30	72	0.30	72	0.30
116-9	75	0.70	75	0.70	75	0.70	75	0.70	75	0.70	75	0.70	75	0.70
116-10	75	0.33	75	0.33	75	0.33	75	0.33	75	0.33	75	0.33	75	0.33
116-11	72	0.34	72	0.34	72	0.34	72	0.34	72	0.34	72	0.34	72	0.34
116-12	72	0.31	72	0.31	72	0.31	72	0.31	72	0.31	72	0.31	72	0.31
116-13	72	0.59	72	0.59	72	0.59	72	0.59	72	0.59	84	0.53	88	0.52
116-14	73	0.41	77	0.40	74	0.41	77	0.40	77	0.40	80	0.37	88	0.38
NW187-C	80	0.64	80	0.64	80	0.64	80	0.64	80	0.64	91	0.57	91	0.57
116-1	73	0.51	73	0.51	73	0.51	73	0.51	73	0.51	73	0.51	73	0.51
116-7	73	0.53	73	0.53	73	0.53	73	0.53	73	0.53	76	0.53	76	0.53
116-8	74	0.58	74	0.58	74	0.58	74	0.58	74	0.58	74	0.58	74	0.58
125A-5	73	0.30	73	0.30	73	0.30	88	0.25	88	0.25	88	0.25	88	0.25
125A-8	73	0.22	73	0.22	73	0.22	84	0.18	88	0.18	88	0.18	88	0.18
125A-9	73	0.21	73	0.21	73	0.21	88	0.16	88	0.16	88	0.16	88	0.16
125A-10	74	0.39	74	0.39	74	0.39	74	0.39	80	0.38	79	0.35	89	0.33
125A-11	74	0.40	74	0.40	74	0.40	75	0.40	83	0.35	87	0.35	89	0.34
125A-12	76	0.41	76	0.41	76	0.41	76	0.41	76	0.41	77	0.38	90	0.35
125A-13	74	0.60	74	0.60	74	0.60	75	0.60	83	0.55	82	0.55	89	0.53
125A-14	73	0.47	73	0.47	73	0.47	75	0.46	84	0.41	84	0.41	87	0.41
125A-15	75	0.39	75	0.39	75	0.39	75	0.39	75	0.39	80	0.38	88	0.33
125A-16	76	0.57	76	0.57	76	0.57	76	0.57	76	0.57	79	0.56	89	0.51
125B-1	73	0.28	73	0.28	73	0.28	88	0.23	88	0.23	88	0.23	88	0.23
125B-2	73	0.28	73	0.28	73	0.28	84	0.24	84	0.24	84	0.24	84	0.24
125B-3	73	0.36	73	0.36	73	0.36	88	0.30	88	0.30	88	0.30	88	0.30
125B-4	73	0.39	73	0.39	73	0.39	84	0.35	84	0.35	84	0.35	84	0.35
125A-1	73	0.34	73	0.34	73	0.34	76	0.33	80	0.30	84	0.29	88	0.28
125A-2	73	0.31	73	0.31	73	0.31	85	0.27	88	0.26	88	0.26	88	0.26
125A-3	73	0.32	73	0.32	73	0.32	88	0.27	88	0.27	88	0.27	88	0.27
125A-4	73	0.30	73	0.30	73	0.30	88	0.25	88	0.25	88	0.25	88	0.25
125A-6	73	0.26	73	0.26	73	0.26	73	0.26	78	0.25	81	0.23	89	0.21
125A-7	73	0.28	73	0.28	73	0.28	77	0.27	82	0.25	84	0.24	88	0.23
213A-2	73	0.38	73	0.38	73	0.38	73	0.38	73	0.38	73	0.38	73	0.38
213A-3	73	0.35	73	0.35	73	0.35	73	0.35	73	0.35	73	0.35	73	0.35
213A-4	73	0.31	73	0.31	73	0.31	73	0.31	73	0.31	73	0.31	73	0.31
OFF1A-2	75	0.31	74	0.31	74	0.31	74	0.31	74	0.31	74	0.31	74	0.31
OFF1A-3	74	0.36	74	0.36	74	0.36	74	0.36	74	0.36	74	0.36	74	0.36
OFF1A-4	73	0.33	73	0.33	73	0.33	73	0.33	73	0.33	73	0.33	73	0.33
213A-6	73	0.40	73	0.40	73	0.40	73	0.40	73	0.40	73	0.40	73	0.40
213A-7	73	0.32	73	0.32	73	0.32	73	0.32	73	0.32	73	0.32	73	0.32
213A-8	73	0.32	73	0.32	73	0.32	73	0.32	73	0.32	88	0.29	73	0.32
213A-9	73	0.42	73	0.42	73	0.42	73	0.42	73	0.42	88	0.39	73	0.42
213A-10	73	0.32	73	0.32	73	0.32	73	0.32	73	0.32	73	0.32	73	0.32
213A-11	73	0.32	73	0.32	73	0.32	73	0.32	73	0.32	73	0.32	73	0.32
213B-1	73	0.32	73	0.32	73	0.32	73	0.32	73	0.32	73	0.32	73	0.32
213B-2	73	0.32	73	0.32	73	0.32	73	0.32	73	0.32	73	0.32	73	0.32
213B-3	73	0.32	73	0.32	73	0.32	73	0.32	73	0.32	73	0.32	73	0.32
213B-4	73	0.33	73	0.33	73	0.33	73	0.33	73	0.33	73	0.33	73	0.33
213B-5	73	0.36	73	0.36	73	0.36	73	0.36	73	0.36	73	0.36	73	0.36
213B-6	73	0.32	73	0.32	73	0.32	73	0.32	73	0.32	73	0.32	73	0.32
213B-7	73	0.39	73	0.39	73	0.39	73	0.39	73	0.39	73	0.39	73	0.39
223A-2	73	0.30	73	0.30	88	0.24	88	0.24	88	0.24	88	0.24	88	0.24
223A-3	73	0.33	73	0.33	73	0.33	73	0.33	73	0.33	73	0.33	73	0.33
223B-2	73	0.27	73	0.27	86	0.24	86	0.22	86	0.22	86	0.22	86	0.22
223B-3	73	0.36	73	0.36	87	0.31	87	0.31	87	0.31	87	0.31	87	0.31
223B-4	73	0.34	73	0.34	88	0.29	88	0.29	88	0.29	88	0.29	88	0.29
223B-5	73	0.37	73	0.37	73	0.37	86	0.32	88	0.31	88	0.31	88	0.31
223B-6	73	0.40	73	0.40	73	0.40	74	0.40	79	0.38	81	0.35	88	0.34
223B-7	73	0.27	73	0.27	88	0.22	88	0.22	88	0.22	88	0.22	88	0.22
223C-1	73	0.36	73	0.36	88	0.30	88	0.30	88	0.30	88	0.30	88	0.30
223C-2	73	0.35	73	0.35	73	0.35	88	0.30	88	0.30	88	0.30	88	0.30
223C-3	73	0.35	73	0.35	73	0.35	85	0.31	88	0.30	88	0.30	88	0.30
223C-4	73	0.46	73	0.46	73	0.46	76	0.42	78	0.42	83	0.41	83	0.41
223C-5	73	0.22	73	0.22	73	0.22	73	0.22	73	0.22	73	0.22	73	0.22
223C-6	73	0.34	73	0.34	73	0.34	73	0.34	73	0.34	73	0.34	73	0.34
223C-7	73	0.35	73	0.35	73	0.35	73	0.35	73	0.35	73	0.35	73	0.35
223C-8	73	0.35	73	0.35	73	0.35	73	0.35	73	0.35	73	0.35	73	0.35
223C-9	73	0.42	73	0.42	73	0.42	77	0.41	81	0.37	85	0.37	88	0.36
223C-10	73	0.26	73	0.26	73	0.26	73	0.26	73	0.26	73	0.26	73	0.26
223C-11	73	0.34	73	0.34	73	0.34	73	0.34	73	0.34	73	0.34	73	0.34
223C-12	73	0.33	73	0.33	73	0.33	73	0.33	73	0.33	73	0.33	73	0.33
223C-13	73	0.34	73	0.34	87	0.28	88	0.28	88	0.28	88	0.28	88	0.28
223C-14	75	0.45	75	0.45	77	0.44	79	0.44	83	0.40	85	0.40	89	0.39
223C-15	73	0.26	73	0.26	73	0.26	73	0.26	73	0.26	73	0.26	73	0.26
223C-16	73	0.34	73	0.34	73	0.34	73	0.34	73	0.34	73	0.34	73	0.34
223C-17	73	0.35	73	0.35	88	0.30	88	0.30	88	0.30	88	0.30	88	0.30
223C-18	73	0.36	73	0.36	87	0.30	88	0.30	88	0.30	88	0.30	88	0.30
223C-19	76	0.44	80	0.43	77	0.44	80	0.41	83	0.40	88	0.39	89	0.39
223C-20	73	0.26	73	0.26	73	0.26	73	0.26	73	0.26	73	0.26	73	0.26
223C-21	73	0.34	73	0.34	88	0.29	88	0.29	88	0.29	88	0.29	88	0.29

223C-22	73	0.37	73	0.37	88	0.32	88	0.32	88	0.32	88	0.32	88	0.32
223C-23	73	0.37	83	0.34	80	0.35	83	0.32	85	0.32	85	0.32	85	0.32
223C-24	77	0.46	78	0.46	77	0.46	78	0.46	83	0.42	89	0.41	89	0.41
NW1-C	81	0.29	81	0.29	81	0.29	81	0.29	81	0.29	81	0.29	81	0.29
NW2-C	73	0.39	73	0.39	73	0.39	73	0.39	73	0.39	73	0.39	73	0.39
NW5-C	73	0.34	73	0.34	73	0.34	73	0.34	73	0.34	73	0.34	73	0.34
NW7-C	84	0.39	84	0.39	84	0.39	84	0.39	84	0.39	84	0.39	84	0.39
NW9-C	73	0.34	73	0.34	73	0.34	73	0.34	73	0.34	73	0.34	73	0.34
NW11-C	73	0.31	73	0.31	73	0.31	73	0.31	73	0.31	73	0.31	73	0.31
NW17-C	73	0.41	73	0.41	73	0.41	73	0.41	73	0.41	73	0.41	73	0.41
NW21-C	84	0.34	84	0.34	84	0.34	84	0.34	84	0.34	84	0.34	84	0.34
NW23-C	73	0.38	73	0.38	73	0.38	73	0.38	73	0.38	73	0.38	73	0.38
NW33-C	86	0.26	86	0.26	86	0.26	86	0.26	86	0.26	86	0.26	86	0.26
NW35-C	83	0.24	83	0.24	83	0.24	83	0.24	83	0.24	83	0.24	83	0.24
NW50-C	73	0.31	73	0.31	73	0.31	73	0.31	73	0.31	73	0.31	73	0.31
NW51-C	73	0.27	73	0.27	73	0.27	73	0.27	73	0.27	73	0.27	73	0.27
NW64-C	73	0.37	73	0.37	73	0.37	73	0.37	73	0.37	73	0.37	73	0.37
NW102-C	73	0.44	73	0.44	73	0.44	73	0.44	73	0.44	73	0.44	73	0.44
NW130-C	75	0.42	75	0.42	75	0.42	75	0.42	75	0.42	75	0.42	75	0.42
OFF1A-5	73	0.39	73	0.39	73	0.39	73	0.39	73	0.39	73	0.39	73	0.39
OFF1A-6	73	0.36	73	0.36	73	0.36	73	0.36	73	0.36	73	0.36	73	0.36
OFF2A	73	0.33	73	0.33	73	0.33	73	0.33	73	0.33	73	0.33	73	0.33
OFF2B	73	0.23	73	0.23	73	0.23	73	0.23	73	0.23	73	0.23	73	0.23
OFF3	73	0.30	73	0.30	73	0.30	73	0.30	73	0.30	73	0.30	73	0.30
OFF4-1	77	0.33	77	0.33	77	0.33	77	0.33	77	0.33	77	0.33	77	0.33
OFF4-2	79	0.16	79	0.16	79	0.16	79	0.16	79	0.16	79	0.16	79	0.16
OFF5-1	80	0.24	80	0.24	80	0.24	80	0.24	80	0.24	80	0.24	80	0.24
OFF5-2	86	0.34	86	0.34	86	0.34	86	0.34	86	0.34	86	0.34	86	0.34
OFF8	86	0.27	86	0.27	86	0.27	86	0.27	86	0.27	86	0.27	86	0.27
OFF9	86	0.39	86	0.39	86	0.39	86	0.39	86	0.39	86	0.39	86	0.39

APPENDIX C
HEC-1 OUTPUT SUMMARY

```
1****************************************                                                    ****************************************
 *                                      *                                                    *                                      *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *                                                    *    U.S. ARMY CORPS OF ENGINEERS      *
 *              JUN   1998              *                                                    *    HYDROLOGIC ENGINEERING CENTER     *
 *           VERSION 4.1                *                                                    *          609 SECOND STREET           *
 *                                      *                                                    *       DAVIS, CALIFORNIA 95616        *
 *  RUN DATE   09JAN09  TIME  11:08:05  *                                                    *           (916) 756-1104             *
 *                                      *                                                    *                                      *
 ****************************************                                                    ****************************************


                                                X     X  XXXXXXX   XXXXX           X
                                                X     X  X        X     X         XX
                                                X     X  X        X                X
                                                XXXXXXX  XXXX     X        XXXXX   X
                                                X     X  X        X                X
                                                X     X  X        X     X          X
                                                X     X  XXXXXXX   XXXXX          XXX


          THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

          THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
          THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
          NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
          DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL   LOSS RATE:GREEN AND AMPT INFILTRATION
          KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

1                                                   HEC-1 INPUT                                                   PAGE  1

          LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

                        *DIAGRAM
 *** FREE ***
             1          ID    KLEINFELDER
             2          ID    FEBRUARY 2008
             3          ID
             4          ID    THIS MODEL OUTPUT PRESENTS THE BASIN CHARACTERISTICS, ROUTING ELEMENTS,
             5          ID    AND ROUTING NETWORK FOR THE BASELINE ALTERNATIVE. HOWEVER, THE OUTPUT
             6          ID    IS ALSO AN EXAMPLE OF THE ROUTING NETWORK USED IN ALL ALTERNATIVES. ONLY
             7          ID    THE LS AND UD CARDS WERE CHANGED IN OTHER MODELS TO REFELCT CHANGES AMONG
             8          ID    ALTERNATIVES.
             9          ID
            10          ID
            11          ID    DESIGN STORM = 100-YEAR 6-HOUR STORM
            12          ID    STORM DISTRIBUTION = SDN5
            13          ID
            14          ID
            15          IT       5       0       0     300
            16          IO       5       0       0
            17          IN       5       0       0
            18          JR    PREC   1.000   0.870   0.740   0.570   0.440   0.260
                        *
                        * SDN5

            19          KK  223B-2
            20          BA   0.191
            21          PB    2.77
            22          PC   0.000   0.020   0.059   0.080   0.110   0.144   0.150   0.160   0.168   0.171
            23          PC   0.180   0.182   0.187   0.190   0.197   0.202   0.210   0.220   0.230   0.241
            24          PC   0.250   0.259   0.265   0.280   0.290   0.300   0.305   0.309   0.310   0.317
            25          PC   0.321   0.327   0.333   0.346   0.361   0.381   0.408   0.430   0.477   0.514
            26          PC   0.561   0.630   0.710   0.720   0.731   0.752   0.779   0.790   0.795   0.804
            27          PC   0.810   0.820   0.826   0.840   0.859   0.889   0.910   0.938   0.966   0.970
            28          PC   0.974   0.979   0.981   0.983   0.985   0.989   0.990   0.992   0.993   0.996
            29          PC   0.997   0.999   1.000
            30          LS       0      73
            31          UD   0.266
                        *

            32          KK R223B-2
            33          KM   ROUTE 223B-2 TO 223B-3
            34          RD    2600  0.0204    0.05       0    TRAP      10      15
                        *
```

```
  35          KK  223B-3
  36          BA   0.257
  37          LS       0      73
  38          UD   0.363
              *

  39          KK C223B-3
  40          KM   COMBINE R223B-2 AND 223B-3
  41          HC       2
              *
```



```
 LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

  42          KKRC223B-3
  43          KM   ROUTE C223B-3 TO 223B-4
  44          RD    2600  0.0181    0.05       0    TRAP      10      15
              *

  45          KK  223B-4
  46          BA   0.244
  47          LS       0      73
  48          UD   0.344
              *

  49          KK C223B-4
  50          KM   COMBINE RC223B-3 AND 223B-4
  51          HC       2
              *

  52          KKRC223B-4
  53          KM   ROUTE C223B-4 TO 223B-5
  54          RD    2600  0.0192    0.05       0    TRAP      10      15
              *

  55          KK  223B-5
  56          BA   0.252
  57          LS       0      73
  58          UD   0.370
              *

  59          KK C223B-5
  60          KM   COMBINE RC223B-4 AND 223B-5
  61          HC       2
              *

  62          KKRC223B-5
  63          KM   ROUTE C223B-5 TO 223B-6
  64          RD    2600  0.0075    0.05       0    TRAP      10      15
              *

  65          KK  223B-6
  66          BA   0.192
  67          LS       0      73
  68          UD   0.399
              *

  69          KK C223B-6
  70          KM   COMBINE RC223B-5 AND 223B-6
  71          HC       2
              *

  72          KK  223B-7
  73          BA   0.230
  74          LS       0      73
  75          UD   0.267
              *
```



```
 LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

  76          KK R223B-7
  77          KM   ROUTE 223B-7 TO 223C-1
  78          RD    2600  0.0211    0.05       0    TRAP      10      15
              *

  79          KK  223C-1
  80          BA   0.266
  81          LS       0      73
```

```
 82          UD   0.360
             *

 83          KK C223C-1
 84          KM   COMBINE R223B-7 AND 223C-1
 85          HC       2
             *

 86          KKRC223C-1
 87          KM   ROUTE C223C-1 TO 223C-2
 88          RD    2600  0.0212    0.05       0    TRAP      10      15
             *

 89          KK  223C-2
 90          BA   0.273
 91          LS       0      73
 92          UD   0.354
             *

 93          KK C223C-2
 94          KM   COMBINE RC223C-1 AND 223C-2
 95          HC       2
             *

 96          KKRC223C-2
 97          KM   ROUTE C223C-2 TO 223C-3
 98          RD    2600  0.0211    0.05       0    TRAP      10      15
             *

 99          KK  223C-3
100          BA   0.273
101          LS       0      73
102          UD   0.354
             *

103          KK C223C-3
104          KM   COMBINE RC223C-2 AND 223C-3
105          HC       2
             *

106          KK2C223C-3
107          KM   COMBINE C223C-3 AND C223B-6
108          HC       2
             *
```



```
LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

109          KKRC223C-3
110          KM   ROUTE C223C-3 TO 223C-4
111          KM   FACILITY = UPPER LAS VEGAS WASH WEST
112          KM   FACILITY ID-MILE = UPWE 0000
113          KM   LINING = CONCRETE
114          RD    2500  0.0115   0.015       0    DEEP      30       0
             *

115          KK  125A-1
116          BA   0.393
117          LS       0      73
118          UD   0.335
             *

119          KK     DP1
120          KM   COMBINE 125A-1 AND RC223C-3
121          HC       2
             *

122          KKRC125A-1
123          KM   ROUTE C223C-3 TO 223C-4
124          RD    2300  0.0115    0.05       0    TRAP      10      15
             *

125          KK  223C-4
126          BA   0.262
127          LS       0      73
128          UD   0.459
             *

129          KK C223C-4
130          KM   COMBINE RC223C-3 AND 223C-4
```

```
 131          HC       2
              *

 132          KK  223C-5
 133          BA   0.219
 134          LS       0      73
 135          UD   0.224
              *

 136          KK R223C-5
 137          KM   ROUTE 223C-5 TO 223C-6
 138          RD    2600  0.0231    0.05       0    TRAP      10      15
              *

 139          KK  223C-6
 140          BA   0.249
 141          LS       0      73
 142          UD   0.344
              *
```



```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


 143          KK C223C-6
 144          KM   COMBINE R223C-5 AND 223C-6
 145          HC       2
              *

 146          KKRC223C-6
 147          KM   ROUTE C223C-6 TO 223C-7
 148          RD    2600  0.0212    0.05       0    TRAP      10      15
              *

 149          KK  223C-7
 150          BA   0.250
 151          LS       0      73
 152          UD   0.349
              *

 153          KK C223C-7
 154          KM   COMBINE RC223C-6 AND 223C-7
 155          HC       2
              *

 156          KKRC223C-7
 157          KM   ROUTE C223C-7 TO 223C-8
 158          RD    2600  0.0231    0.05       0    TRAP      10      15
              *

 159          KK  223C-8
 160          BA   0.251
 161          LS       0      73
 162          UD   0.353
              *

 163          KK C223C-8
 164          KM   COMBINE RC223C-7 AND 223C-8
 165          HC       2
              *

 166          KK1RC23C-8
 167          KM   ROUTE C223C-8 TO UPWE 0000
 168          RD    1600  0.0231    0.05       0    TRAP      10      15
              *

 169          KK2C223C-8
 170          KM   COMBINE 1RC23C-8 AND C223C-4
 171          HC       2
              *

 172          KK2RC23C-8
 173          KM   ROUTE 2C223C-8 TO 223C-9
 174          RD    1400  0.0197    0.05       0    TRAP      20      10
              *
```



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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


 175          KK  125A-2
```

```
 176          BA   0.339
 177          LS       0      73
 178          UD   0.311
              *

 179          KK R125A-2
 180          KM   ROUTE 125A-2 TO 125A-6
 181          KM   STREET NAME = HUALAPAI
 182          RD    2400  0.0317    0.05       0    TRAP      10      15
              *

 183          KK  125A-6
 184          BA   0.165
 185          LS       0      73
 186          UD   0.263
              *

 187          KK C125A-6
 188          KM   COMBINE 125A-6, R125A-2 AND RC125A-1
 189          KM   COMBINATION @ HUALAPAI AND US95
 190          HC       3
              *

 191          KKRC125A-6
 192          KM   ROUTE 2C223C-8 TO 223C-9
 193          RD    2300  0.0197    0.05       0    TRAP      20      10
              *

 194          KK  223C-9
 195          BA   0.313
 196          LS       0      73
 197          UD   0.418
              *

 198          KK C223C-9
 199          KM   COMBINE RC223C-8 AND 223C-9
 200          HC       2
              *

 201          KK  125A-3
 202          BA   0.357
 203          LS       0      73
 204          UD   0.321
              *

 205          KK R125A-3
 206          KM   ROUTE 125A-3 TO 125A-7
 207          KM   STREET NAME = GRAND CANYON
 208          RD    4900  0.0265    0.05       0    TRAP      10      15
              *
1                                          HEC-1 INPUT                                                PAGE  7

LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 209          KK  125A-7
 210          BA   0.382
 211          LS       0      73
 212          UD   0.284
              *

 213          KK C125A-7
 214          KM   COMBINE 125A-7, R125A-3 AND RC125A-6
 215          KM   COMBINATION @ GRAND CANYON AND US95
 216          HC       3
              *

 217          KK 223C-10
 218          BA   0.241
 219          LS       0      73
 220          UD   0.256
              *

 221          KKR223C-10
 222          KM   ROUTE 223C-10 TO 223C-11
 223          RD    2600  0.0212    0.05       0    TRAP      10      15
              *

 224          KK 223C-11
 225          BA   0.250
 226          LS       0      73
```

```
 227          UD   0.337
              *

 228          KKC223C-11
 229          KM   COMBINE R223C-10 AND 223C-11
 230          HC       2
              *

 231          KKRC23C-11
 232          KM   ROUTE C223C-11 TO 223C-12
 233          RD    2600   0.025    0.05       0    TRAP      10      15
              *

 234          KK 223C-12
 235          BA   0.251
 236          LS       0      73
 237          UD   0.335
              *

 238          KKC223C-12
 239          KM   COMBINE RC23C-11 AND 223C-12
 240          HC       2
              *
```



```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


 241          KKRC23C-12
 242          KM   ROUTE C223C-12 TO 223C-13
 243          RD    2600   0.025    0.05       0    TRAP      10      15
              *

 244          KK 223C-13
 245          BA   0.247
 246          LS       0      73
 247          UD   0.335
              *

 248          KKC223C-13
 249          KM   COMBINE RC23C-12 AND 223C-13
 250          HC       2
              *

 251          KK1RC3C-13
 252          KM   ROUTE C223C-13 TO UPWE 0000
 253          RD    2200  0.0218    0.05       0    TRAP      10      15
              *

 254          KK2C23C-13
 255          KM   COMBINE 1RC3C-13 AND C223C-9
 256          HC       2
              *

 257          KK2RC3C-13
 258          KM   ROUTE 2C23C-13 TO 223C-14
 259          RD    4000  0.0105    0.05       0    TRAP      10      15
              *

 260          KK 223C-14
 261          BA   0.375
 262          LS       0      75
 263          UD   0.448
              *

 264          KKC223C-14
 265          KM   COMBINE 2RC3C-13 AND 223C-14
 266          HC       2
              *

 267          KK  125A-4
 268          BA   0.317
 269          LS       0      73
 270          UD   0.302
              *

 271          KK R125A-4
 272          KM   ROUTE 125A-4 TO 125A-8
 273          KM   STREET NAME = FORT APACHE
 274          RD    3400  0.0324    0.05       0    TRAP      10      15
              *
```

```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 275          KK  125A-8
 276          BA   0.328
 277          LS       0      73
 278          UD   0.223
              *

 279          KK C125A-8
 280          KM   COMBINE 125A-8 AND R125A-4
 281          KM   COMBINATION @ FORT APACHE AND US95
 282          HC       2
              *

 283          KKRC125A-8
 284          KM   ROUTE C125A-8 TO 125A-10
 285          KM   STREET NAME = FORT APACHE
 286          RD    3400  0.0162    0.05       0    TRAP      10      15
              *

 287          KK 125A-10
 288          BA   0.239
 289          LS       0      74
 290          UD   0.389
              *

 291          KKC125A-10
 292          KM   COMBINE 125A-10, RC125A-8 AND RC125A-7
 293          KM   COMBINATION @ FORT APACHE AND US95
 294          HC       3
              *

 295          KK 223C-15
 296          BA   0.251
 297          LS       0      73
 298          UD   0.263
              *

 299          KKR223C-15
 300          KM   ROUTE 223C-15 TO 223C-16
 301          RD    2600   0.025    0.05       0    TRAP      10      15
              *

 302          KK 223C-16
 303          BA   0.251
 304          LS       0      73
 305          UD   0.337
              *

 306          KKC223C-16
 307          KM   COMBINE R223C-15 AND 223C-16
 308          HC       2
              *
```



```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 309          KKRC23C-16
 310          KM   ROUTE C223C-16 TO 223C-17
 311          RD    2600   0.025    0.05       0    TRAP      10      15
              *

 312          KK 223C-17
 313          BA   0.248
 314          LS       0      73
 315          UD   0.351
              *

 316          KKC223C-17
 317          KM   COMBINE RC23C-16 AND 223C-17
 318          HC       2
              *

 319          KKRC23C-17
 320          KM   ROUTE C223C-17 TO 223C-18
 321          RD    2600  0.0269    0.05       0    TRAP      10      15
              *
```

```
 322          KK 223C-18
 323          BA   0.258
 324          LS       0      73
 325          UD   0.355
              *

 326          KKC223C-18
 327          KM   COMBINE RC23C-17 AND 223C-18
 328          HC       2
              *

 329          KK1RC3C-18
 330          KM   ROUTE C223C-18 TO UPWE 0000
 331          RD    3000    0.02    0.05       0    TRAP      10      15
              *

 332          KK2C23C-18
 333          KM   COMBINE 1RC3C-18 AND C223C-14
 334          HC       2
              *

 335          KK2RC3C-18
 336          KM   ROUTE 2C23C-18 TO 223C-19
 337          RD    2800  0.0714    0.05       0    TRAP      20      10
              *

 338          KK 223C-19
 339          BA   0.373
 340          LS       0      76
 341          UD   0.443
              *
```



```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 342          KKC223C-19
 343          KM   COMBINE RC23C-18 AND 223C-19
 344          HC       2
              *

 345          KK  125A-5
 346          BA   0.305
 347          LS       0      73
 348          UD   0.299
              *

 349          KK R125A-5
 350          KM   ROUTE 125A-5 TO 125A-9
 351          KM   STREET NAME = EL CAPITAN
 352          RD    3400  0.0324    0.05       0    TRAP      10      15
              *

 353          KK  125A-9
 354          BA   0.326
 355          LS       0      73
 356          UD   0.209
              *

 357          KK C125A-9
 358          KM   COMBINE 125A-9 AND R125A-5
 359          HC       2
              *

 360          KKRC125A-9
 361          KM   ROUTE C125A-9 TO 125A-11
 362          KM   STREET NAME = EL CAPITAN
 363          RD    2500   0.022    0.05       0    TRAP      10      15
              *

 364          KK 125A-11
 365          BA   0.253
 366          LS       0      74
 367          UD   0.399
              *

 368          KKC125A-11
 369          KM   COMBINE 125A-11 AND RC125A-9
 370          HC       2
              *
```

```
 371          KKRC25A-11
 372          KM   ROUTE C125A-11 TO 125A-12
 373          KM   STREET NAME = EL CAPITAN TO US 95
 374          RD    3700  0.0081    0.05       0    TRAP      10      15
              *
1                                   HEC-1 INPUT                                                PAGE 12

LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


 375          KK 125A-12
 376          BA   0.225
 377          LS       0      76
 378          UD   0.409
              *

 379          KKC125A-12
 380          KM   COMBINE 125A-12, RC25A-11 AND RC25A-10
 381          KM   COMBINATION @ DURANGO AND US95
 382          HC       3
              *

 383          KK 223C-20
 384          BA   0.265
 385          LS       0      73
 386          UD   0.261
              *

 387          KKR223C-20
 388          KM   ROUTE 223C-20 TO 223C-21
 389          RD    2600   0.025    0.05       0    TRAP      10      15
              *

 390          KK 223C-21
 391          BA   0.252
 392          LS       0      73
 393          UD   0.344
              *

 394          KKC223C-21
 395          KM   COMBINE R223C-20 AND 223C-21
 396          HC       2
              *

 397          KKRC23C-21
 398          KM   ROUTE C223C-21 TO 223C-22
 399          RD    2600  0.0288    0.05       0    TRAP      10      15
              *

 400          KK 223C-22
 401          BA   0.262
 402          LS       0      73
 403          UD   0.372
              *

 404          KKC223C-22
 405          KM   COMBINE RC23C-21 AND 223C-22
 406          HC       2
              *
1                                   HEC-1 INPUT                                                PAGE 13

LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


 407          KKRC23C-22
 408          KM   ROUTE C223C-22 TO 223C-23
 409          RD    2600   0.025    0.05       0    TRAP      10      15
              *

 410          KK 223C-23
 411          BA   0.253
 412          LS       0      73
 413          UD   0.367
              *

 414          KKC223C-23
 415          KM   COMBINE RC23C-22 AND 223C-23
 416          HC       2
              *
```

```
 417          KK1RC3C-23
 418          KM   ROUTE C223C-23 TO UPWE 000
 419          RD    2100   0.019    0.05       0    TRAP      10      15
              *

 420          KK2C23C-23
 421          KM   COMBINE 1RC3C-23 AND C223C-19
 422          HC       2
              *

 423          KK2RC3C-23
 424          KM   ROUTE 2C23C-23 TO 223C-24
 425          RD    3200  0.0125    0.05       0    TRAP      10      15
              *

 426          KK 223C-24
 427          BA   0.315
 428          LS       0      77
 429          UD   0.464
              *

 430          KKC223C-24
 431          KM   COMBINE RC23C-23 AND 223C-24
 432          HC       2
              *

 433          KK 125A-13
 434          BA   0.519
 435          LS       0      74
 436          UD   0.600
              *

 437          KKR125A-13
 438          KM   ROUTE 125A-13 TO 125A-15
 439          KM   STREET NAME = CIMARROW
 440          RD    3200  0.0094    0.05       0    TRAP      10      15
              *
```



```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 441          KK 125A-15
 442          BA   0.219
 443          LS       0      75
 444          UD   0.389
              *

 445          KK DP2WASH
 446          KM   COMBINE 125A-15, R125A-13 AND RC25A-12
 447          KM   CIMARRON AND MOCCASIN
 448          HC       3
              *

 449          KK  223A-1
 450          BA   6.378
 451          LS       0      74
 452          UD   0.972
              *

 453          KK  223A-2
 454          BA   0.384
 455          LS       0      73
 456          UD   0.295
              *

 457          KK C223A-2
 458          KM   COMBINE C223A-1 AND 223A-2
 459          HC       2
              *

 460          KK  223A-3
 461          BA   0.250
 462          LS       0      73
 463          UD   0.331
              *

 464          KK R223A-3
 465          KM   ROUTE 223A-2 TO C223A-2
 466          RD    1300  0.0308    0.05       0    TRAP      10      15
              *
```

```
 467          KK C223A-3
 468          KM   COMBINE R223A-3 AND C223A-2
 469          HC       2
              *

 470          KKRC223A-3
 471          RD    3500  0.0057    0.05       0    TRAP      10       5
              *
```



```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 472          KK  213A-6
 473          BA   0.279
 474          LS       0      73
 475          UD   0.395
              *

 476          KK C213A-6
 477          KM   COMBINE RC223A-3 AND 213A-6
 478          HC       2
              *

 479          KK  213A-7
 480          BA   0.251
 481          LS       0      73
 482          UD   0.319
              *

 483          KK R213A-7
 484          KM   ROUTE 213A-7 TO 213A-8
 485          RD    2600  0.0288    0.05       0    TRAP      10      15
              *

 486          KK  213A-8
 487          BA   0.255
 488          LS       0      73
 489          UD   0.322
              *

 490          KK C213A-8
 491          KM   COMBINE R213A-7 AND 213A-8
 492          HC       2
              *

 493          KKRC213A-8
 494          KM   ROUTE C213A-8 TO 213A-6
 495          RD    1500    0.02    0.05       0    TRAP      10      15
              *

 496          KK2C213A-6
 497          KM   COMBINE C213A-6 AND RC213A-8
 498          HC       2
              *

 499          KKRC213A-6
 500          KM   ROUTE C213A-6 TO 213A-9
 501          RD    3200  0.0063    0.05       0    TRAP      10       5
              *

 502          KK  213A-9
 503          BA   0.252
 504          LS       0      73
 505          UD   0.423
              *
```



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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 506          KK C213A-9
 507          KM   COMBINE RC213A-6 AND 213A-9
 508          HC       2
              *

 509          KK  213A-2
 510          BA   0.500
 511          LS       0      73
 512          UD   0.380
```

```
                 *

513              KKRC213A-2
514              KM   ROUTE C213A-2 TO 213A-3
515              KM   IRON MOUNTAIN
516              RD    2600  0.0269    0.05       0    TRAP      10      15
                 *

517              KK  213A-3
518              BA   0.371
519              LS       0      73
520              UD   0.353
                 *

521              KK C213A-3
522              KM   COMBINE RC213A-2 AND 213A-3
523              KM   IRON MOUNTAIN AND HURTADO
524              HC       2
                 *

525              KKRC213A-3
526              KM   ROUTE C213A-3 TO 213A-4
527              KM   IRON MOUNTAIN
528              RD    2600  0.0346    0.05       0    TRAP      10      15
                 *

529              KK  213A-4
530              BA   0.251
531              LS       0      73
532              UD   0.311
                 *

533              KK C213A-4
534              KM   COMBINE RC213A-3 AND 213A-4
535              KM   IRON MOUNTAIN AND WOOLBRIGHT
536              HC       2
                 *

537              KKRC213A-4
538              KM   ROUTE C213A-4 TO 213A-5
539              KM   NATURAL WASH
540              KM   TRAVEL LENGTH = 13,000
541              KM   SLOPE = 3.5%
542              KM   N = 0.040
543              KM   HYDRAULIC RADIUS = 1.5
```



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            LINE ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

544              KM   VELOCITY =
545              RM       3   0.247    0.15
                 *

546              KK  213A-5
547              BA   2.059
548              LS       0      73
549              UD   0.701
                 *

550              KK C213A-5
551              KM   COMBINE RC213A-4 AND 213A-5
552              HC       2
                 *

553              KKRC213A-5
554              KM   ROUTE C213A-5 TO 213A-10
555              RD    2600  0.0288    0.05       0    TRAP      10      15
                 *

556              KK 213A-10
557              BA   0.252
558              LS       0      73
559              UD   0.324
                 *

560              KKC213A-10
561              KM   COMBINE RC213A-5 AND 213A-10
562              HC       2
                 *

563              KKRC13A-10
```

```
 564          KM   ROUTE C213A-10 TO 213A-11
 565          RD    2600  0.0288    0.05       0    TRAP      10      15
              *

 566          KK 213A-11
 567          BA   0.256
 568          LS       0      73
 569          UD   0.319
              *

 570          KKC213A-11
 571          KM   COMBINE RC13A-10 AND 213A-11
 572          HC       2
              *

 573          KKRC13A-11
 574          KM   ROUTE C213A-11 TO 213B-6
 575          RD    2600  0.0231    0.05       0    TRAP      10      15
              *
1                                          HEC-1 INPUT                                                    PAGE 18

LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


 576          KK  213B-6
 577          BA   0.244
 578          LS       0      73
 579          UD   0.323
              *

 580          KK C213B-6
 581          KM   COMBINE RC13A-11 AND 213B-6
 582          HC       2
              *

 583          KKRC213B-6
 584          KM   ROUTE C213B-6 TO 213A-9
 585          RD    1100  0.0318    0.05       0    TRAP      10      15
              *

 586          KK2C213A-9
 587          KM   COMBINE RC213B-6 AND C213A-9
 588          HC       2
              *

 589          KKRC213A-9
 590          KM   ROUTE C213A-9 TO 213B-7
 591          RD    3200  0.0078    0.05       0    TRAP      10       5
              *

 592          KK  213B-7
 593          BA   0.249
 594          LS       0      73
 595          UD   0.389
              *

 596          KK C213B-7
 597          KM   COMBINE RC13A-11 AND 213B-6
 598          HC       2
              *

 599          KK  213B-1
 600          BA   0.261
 601          LS       0      73
 602          UD   0.319
              *

 603          KK R213B-1
 604          KM   ROUTE 213B-1 TO 213B-2
 605          RD    2600  0.0288    0.05       0    TRAP      10      15
              *

 606          KK  213B-2
 607          BA   0.262
 608          LS       0      73
 609          UD   0.318
              *
1                                          HEC-1 INPUT                                                    PAGE 19

LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10
```

```
 610          KK C213B-2
 611          KM   COMBINE R213B-1 AND 213B-2
 612          HC       2
              *

 613          KKRC213B-2
 614          KM   ROUTE C213B-2 TO 213B-3
 615          RD    2600  0.0269    0.05       0    TRAP      10      15
              *

 616          KK  213B-3
 617          BA   0.253
 618          LS       0      73
 619          UD   0.315
              *

 620          KK C213B-3
 621          KM   COMBINE RC213B-2 AND 213B-3
 622          HC       2
              *

 623          KKRC213B-3
 624          KM   ROUTE C213B-3 TO 213B-4
 625          RD    2600  0.0269    0.05       0    TRAP      10      15
              *

 626          KK  213B-4
 627          BA   0.255
 628          LS       0      73
 629          UD   0.329
              *

 630          KK C213B-4
 631          KM   COMBINE RC213B-3 AND 213B-4
 632          HC       2
              *

 633          KKRC213B-4
 634          KM   ROUTE C213B-4 TO 213B-7
 635          RD    1100  0.0318    0.05       0    TRAP      10      15
              *

 636          KK2C213B-7
 637          KM   COMBINE C213B-7 AND RC213B-4
 638          HC       2
              *

 639          KKRC213B-7
 640          KM   ROUTE C213B-7 TO 213B-5
 641          RD    3200  0.0109    0.05       0    TRAP      10       5
              *
```



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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 642          KK  213B-5
 643          BA   0.240
 644          LS       0      73
 645          UD   0.363
              *

 646          KK C213B-5
 647          KM   COMBINE RC213B-7 AND 213B-5
 648          HC       2
              *

 649          KK OFF1A-2
 650          BA   0.378
 651          LS       0      75
 652          UD   0.305
              *

 653          KKRCFF1A-2
 654          KM   ROUTE COFF1A-2 TO OFF1A-3
 655          KM   SCOTTIE AND RACEL
 656          RD    3600  0.0333    0.05       0    TRAP      10      15
              *

 657          KK OFF1A-3
```

```
 658          BA   0.302
 659          LS       0      74
 660          UD   0.357
              *

 661          KKCOFF1A-3
 662          KM   COMBINE RCFF1A-2 AND OFF1A-3
 663          KM   RACEL AND HURTADO
 664          HC       2
              *

 665          KKRCFF1A-3
 666          KM   ROUTE COFF1A-3 TO OFF1A-4
 667          KM   HURTADO AND HORSE
 668          RD    3900  0.0308    0.05       0    TRAP      10      15
              *

 669          KK OFF1A-4
 670          BA   0.274
 671          LS       0      73
 672          UD   0.328
              *

 673          KKCOFF1A-4
 674          KM   COMBINE RCFF1A-3 AND OFF1A-4
 675          KM   HORSE AND WOOLBRIGHT
 676          HC       2
              *
```



```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 677          KKRCFF1A-4
 678          KM   ROUTE COFF1A-4 TO OFF1A-5
 679          KM   HORSE AND UNKNOWN STREET
 680          RD    5100  0.0333    0.05       0    TRAP      10      15
              *

 681          KK OFF1A-5
 682          BA   0.418
 683          LS       0      73
 684          UD   0.387
              *

 685          KKCOFF1A-5
 686          KM   COMBINE RCFF1A-4 AND OFF1A-5
 687          HC       2
              *

 688          KKRCFF1A-5
 689          KM   ROUTE COFF1A-5 TO OFF2A
 690          KM   IRON MOUNTAIN
 691          RD    2600  0.0288    0.05       0    TRAP      10      15
              *

 692          KK   OFF2A
 693          BA   0.318
 694          LS       0      73
 695          UD   0.335
              *

 696          KK  COFF2A
 697          KM   COMBINE RCFF1A-5 AND OFF2A
 698          HC       2
              *

 699          KK RCOFF2A
 700          KM   ROUTE COFF2A TO OFF3
 701          KM   IRON MOUNTAIN
 702          RD    2600  0.0333    0.05       0    TRAP      10      15
              *

 703          KK    OFF3
 704          BA   0.222
 705          LS       0      73
 706          UD   0.303
              *

 707          KK   COFF3
 708          KM   COMBINE RC0FF2A AND OFF3
```

```
          709          HC       2
                       *
1                                                HEC-1 INPUT                                                PAGE 22

         LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


          710          KK  RCOFF3
          711          KM   ROUTE COFF3 TO OFF2B
          712          RD    2600  0.0212    0.05       0    TRAP      10       5
                       *

          713          KK   OFF2B
          714          BA   0.160
          715          LS       0      73
          716          UD   0.225
                       *

          717          KK  COFF2B
          718          KM   COMBINE RCOFF3 AND OFF2B
          719          HC       2
                       *

          720          KK RCOFF2B
          721          KM   ROUTE COFF2B TO OFF1A-6
          722          RD    2600  0.0296    0.05       0    TRAP      10       5
                       *

          723          KK OFF1A-6
          724          BA   0.473
          725          LS       0      73
          726          UD   0.365
                       *

          727          KKCOFF1A-6
          728          KM   COMBINE RCOFF2B AND OFF1A-6
          729          HC       2
                       *

          730          KKRCFF1A-6
          731          KM   ROUTE COFF1A-6 TO NW5-C
          732          RD    2600  0.0288    0.05       0    TRAP      10       5
                       *

          733          KK   NW2-C
          734          BA   0.395
          735          LS       0      73
          736          UD   0.393
                       *

          737          KK  RNW2-C
          738          KM   ROUTE NW2-C TO NW5-C
          739          RD    2600   0.025    0.05       0    TRAP      10      15
                       *

          740          KK   NW5-C
          741          BA   0.275
          742          LS       0      73
          743          UD   0.335
                       *
1                                                HEC-1 INPUT                                                PAGE 23

         LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


          744          KK  CNW5-C
          745          KM   COMBINE RNW2-C AND NW5-C
          746          HC       2
                       *

          747          KK 2CNW5-C
          748          KM   COMBINE RCFF1A-6 AND CNW5-C
          749          HC       2
                       *

          750          KK RCNW5-C
          751          KM   ROUTE 2CNW5-C TO NW11-C
          752          RD    2600  0.0288    0.05       0    TRAP      10       5
                       *

          753          KK   NW9-C
```

```
754          BA   0.273
755          LS       0      73
756          UD   0.345
             *

757          KK  RNW9-C
758          KM   ROUTE NW9-C TO NW11-C
759          KM   WITCH MOUNTAIN
760          RD    2600  0.0192    0.05       0    TRAP      10      15
             *

761          KK  NW11-C
762          BA   0.270
763          LS       0      73
764          UD   0.309
             *

765          KK CNW11-C
766          KM   COMBINE RNW9-C AND NW11-C
767          KM   WITCH MOUNTAIN AND MOCCASIN
768          HC       2
             *

769          KK2CNW11-C
770          KM   COMBINE RCNW5-C AND CNW11-C
771          KM   WITCH MOUNTAIN AND MOCCASIN
772          HC       2
             *

773          KKRCNW11-C
774          KM   ROUTE 2CNW11-C TO NW17-C
775          RD    2600  0.0327    0.05       0    TRAP      10       5
             *
```



```
LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

776          KK  NW17-C
777          BA   0.430
778          LS       0      73
779          UD   0.410
             *

780          KK CNW17-C
781          KM   COMBINE RCNW11-C AND NW17-C
782          KM   NICKELSON AND MOCCASIN
783          HC       2
             *

784          KKRCNW17-C
785          KM   ROUTE CNW17-C TO NW23-C
786          RD    2600  0.0288    0.05       0    TRAP      10       5
             *

787          KK  NW23-C
788          BA   0.376
789          LS       0      73
790          UD   0.384
             *

791          KK CNW23-C
792          KM   COMBINE RCNW17-C AND NW23-C
793          KM   MAINWAL AND MOCCASIN
794          HC       2
             *

795          KKRCNW23-C
796          KM   ROUTE CNW23-C TO 213B-5
797          RD    3500  0.0286    0.05       0    TRAP      10       5
             *

798          KK2C213B-5
799          KM   COMBINE C213B-5 AND RCNW23-C
800          HC       2
             *

801          KKRC213B-5
802          KM   ROUTE 2C213B-5 TO NW64-C
803          RD    7000  0.0293    0.05       0    TRAP      10       5
             *
```

```
          804          KK  NW51-C
          805          BA   0.306
          806          LS       0      73
          807          UD   0.272
                       *
1                                                HEC-1 INPUT                                                PAGE 25

         LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


          808          KK RNW51-C
          809          KM   ROUTE NW51-C TO NW64-C
          810          RD    5900  0.0305    0.05       0    TRAP      10      15
                       *

          811          KK CNW64-C
          812          KM   COMBINE RC213B-5 AND RNW51-C
          813          HC       2
                       *

          814          KK  OFF4-1
          815          BA   0.301
          816          LS       0      77
          817          UD   0.333
                       *

          818          KK ROFF4-1
          819          KM   ROUTE OFF4-1 TO OFF4-2
          820          KM   KYLE CANYON ROAD
          821          RD    5800  0.0414    0.05       0    TRAP      10      15
                       *

          822          KK  OFF4-2
          823          BA   0.420
          824          LS       0      79
          825          UD   0.160
                       *

          826          KK COFF4-2
          827          KM   COMBINE ROFF4-1 AND OFF4-2
          828          HC       2
                       *

          829          KKRCOFF4-2
          830          KM   ROUTE COFF4-2 TO OFF5-1
          831          KM   KYLE CANYON ROAD
          832          RD    2800  0.0429   0.016       0    TRAP       0      50
                       *

          833          KK  OFF5-1
          834          BA   0.297
          835          LS       0      80
          836          UD   0.244
                       *

          837          KK COFF5-1
          838          KM   COMBINE RCOFF4-2 AND OFF5-1
          839          HC       2
                       *
1                                                HEC-1 INPUT                                                PAGE 26

         LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


          840          KKRCOFF5-1
          841          KM   ROUTE COFF5-1 TO NW1-C
          842          RD    5800  0.0362    0.05       0    TRAP      10       3
                       *

          843          KK  OFF5-2
          844          BA   0.395
          845          LS       0      86
          846          UD   0.336
                       *

          847          KK ROFF5-2
          848          KM   ROUTE OFF5-2 TO NW1-C
          849          RD    2300  0.0239    0.05       0    TRAP      10       3
                       *
```

```
 850          KK   NW1-C
 851          BA   0.293
 852          LS       0      81
 853          UD   0.288
              *

 854          KK  CNW1-C
 855          KM   COMBINE ROFF5-2 AND NW1-C
 856          HC       2
              *

 857          KK 2CNW1-C
 858          KM   COMBINE RCOFF5-1 AND CNW1-C
 859          HC       2
              *

 860          KKR2CNW1-C
 861          KM   ROUTE 2CNW1-C TO NW7-C
 862          RD    5500  0.0373    0.05       0    TRAP      10       5
              *

 863          KK   NW7-C
 864          BA   0.488
 865          LS       0      84
 866          UD   0.391
              *

 867          KK  CNW7-C
 868          KM   COMBINE NW7-C AND R2CNW1-C
 869          HC       2
              *

 870          KK RCNW7-C
 871          KM   ROUTE CNW7-C TO NW21-C
 872          RD    2600  0.0365    0.05       0    TRAP      10       5
              *
```



```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 873          KK  NW21-C
 874          BA   0.403
 875          LS       0      84
 876          UD   0.336
              *

 877          KK CNW21-C
 878          KM   COMBINE RCNW7-C AND NW21-C
 879          KM   MAINWAL AND KYLE CANYON
 880          HC       2
              *

 881          KKRCNW21-C
 882          KM   ROUTE CNW21-C TO NW35-C
 883          RD    4000  0.0063    0.05       0    TRAP      10       5
              *

 884          KK    OFF9
 885          BA   0.303
 886          LS       0      86
 887          UD   0.395
              *

 888          KK   ROFF9
 889          KM   ROUTE OFF9 TO NW33-C
 890          KM   HORSE HUALAPAI WEST
 891          RD    4200  0.0321    0.05       0    TRAP      10      15
              *

 892          KK  NW33-C
 893          BA   0.248
 894          LS       0      86
 895          UD   0.264
              *

 896          KK CNW33-C
 897          KM   COMBINE ROFF9 AND NW33-C
 898          KM   BRENT AND HUALAPAI WEST
 899          HC       2
              *
```

```
 900          KK    OFF8
 901          BA   0.272
 902          LS       0      86
 903          UD   0.267
              *

 904          KK   ROFF8
 905          KM   ROUTE OFF8 TO NW33-C
 906          KM   BRENT
 907          RD    3100  0.0387    0.05       0    TRAP      10      15
              *
1                                   HEC-1 INPUT                                                PAGE 28

LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


 908          KK2CNW33-C
 909          KM   COMBINE ROFF8 AND CNW33-C
 910          KM   BRENT AND HUALAPAI WEST
 911          HC       2
              *

 912          KKRCNW33-C
 913          KM   ROUTE 2CNW33-C TO NW35-C
 914          RD    3000  0.0321    0.05       0    TRAP      10      15
              *

 915          KK  NW35-C
 916          BA   0.434
 917          LS       0      83
 918          UD   0.240
              *

 919          KK CNW35-C
 920          KM   COMBINE RNW33-C AND NW35-C
 921          KM   KYLE CANYON ROAD AND HUALAPAI WEST
 922          HC       2
              *

 923          KK2CNW35-C
 924          KM   COMBINE CNW35-C AND RCNW21-C
 925          KM   KYLE CANYON ROAD AND HUALAPAI WEST
 926          HC       2
              *

 927          KKRCNW35-C
 928          KM   ROUTE 2CNW35-C TO NW50-C
 929          RD    1900  0.0342    0.05       0    TRAP      10       5
              *

 930          KK  NW50-C
 931          BA   0.358
 932          LS       0      73
 933          UD   0.307
              *

 934          KK CNW50-C
 935          KM   COMBINE RCNW35-C AND NW50-C
 936          KM   KYLE CANYON ROAD AND U.S. 95
 937          HC       2
              *

 938          KKRCNW50-C
 939          KM   ROUTE CNW50-C TO NW64-C
 940          RD    6000  0.0275    0.05       0    TRAP      10       5
              *
1                                   HEC-1 INPUT                                                PAGE 29

LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


 941          KK  NW64-C
 942          BA   0.407
 943          LS       0      73
 944          UD   0.366
              *

 945          KK2CNW64-C
 946          KM   COMBINE RCNW50-C AND NW64-C
 947          KM   KYLE CANYON ROAD AND MOCCASIN
```

```
 948          HC       2
              *

 949          KK3CNW64-C
 950          KM   COMBINE 2CNW64-C AND CNW64-C
 951          KM   KYLE CANYON ROAD AND MOCCASIN
 952          HC       2
              *

 953          KKRCNW64-C
 954          KM   ROUTE CNW64-C TO NW102-C
 955          RD    2600  0.0269    0.05       0    TRAP      10       5
              *

 956          KK NW102-C
 957          BA   0.412
 958          LS       0      73
 959          UD   0.442
              *

 960          KKCNW102-C
 961          KM   COMBINE RCNW64-C AND NW102-C
 962          KM   EL CAPITAN AND MOCCASIN
 963          HC       2
              *

 964          KK RC102-C
 965          KM   ROUTE CNW102-C TO NW130-C
 966          RD    4000  0.0225    0.05       0    TRAP      10       5
              *

 967          KK NW130-C
 968          BA   0.241
 969          LS       0      75
 970          UD   0.415
              *

 971          KK DP2WEST
 972          KM   COMBINE RC102-C AND NW130-C
 973          KM   AL CARRISON AND MOCCASIN
 974          HC       2
              *
```



```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 975          KK2CNW130-C
 976          KM   COMBINE C223C-24 AND CNW130-C
 977          HC       2
              *

 978          KKRC25A-15
 979          KM   ROUTE C125A-15 TO 125A-16
 980          KM   FACILITY = UPPER LAS VEGAS WASH
 981          KM   FACILITY ID-MILE = LVUP 0976
 982          KM   LINING = UNLINED
 983          RD    2600  0.0065    0.02       0    TRAP     300       3
              *

 984          KK  125B-1
 985          BA   0.308
 986          LS       0      73
 987          UD   0.281
              *

 988          KK R125B-1
 989          KM   ROUTE 125B-1 TO 125B-3
 990          KM   STREET NAME = CIMARRON
 991          RD    4600  0.0391    0.05       0    TRAP      10      15
              *

 992          KK  125B-3
 993          BA   0.425
 994          LS       0      73
 995          UD   0.356
              *

 996          KK C125B-3
 997          KM   COMBINE 125B-3 AND R125B-1
 998          KM   UPPER LAS VEGAS WASH EAST @ CIMARRON
```

```
 999          HC       2
              *

1000          KKRC125B-3
1001          KM   ROUTE C125B-3 TO 125B-4
1002          RD    3000  0.0083    0.05       0    TRAP      10      15
              *

1003          KK  125B-6
1004          BA   1.693
1005          LS       0      78
1006          UD   0.329
              *

1007          KK R125B-6
1008          KM   ROUTE 125B-6 TO 125B-2
1009          KM   STREET NAME = BUFFALO
1010          RD    3000  0.0433    0.05       0    TRAP      10      15
              *
1                                   HEC-1 INPUT                                                PAGE 31

LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


1011          KK  125B-2
1012          BA   0.313
1013          LS       0      73
1014          UD   0.284
              *

1015          KK C125B-2
1016          KM   COMBINE 125B-2 AND R125B-6
1017          HC       2
              *

1018          KKRC125B-2
1019          KM   ROUTE C125B-2 TO 125B-4
1020          KM   STREET NAME = BUFFALO
1021          RD    5300  0.0377    0.05       0    TRAP      10      15
              *

1022          KK  125B-4
1023          BA   0.517
1024          LS       0      73
1025          UD   0.392
              *

1026          KK C125B-4
1027          KM   COMBINE 125B-4, RC125B-2 AND RC125B-3
1028          KM   STREET FLOW IN BUFFALO @ UPPER LAS VEGAS WASH EAST
1029          HC       3
              *

1030          KKRC125B-4
1031          KM   ROUTE C125B-4 TO 125A-14
1032          RD    4100  0.0146    0.05       0    TRAP      10      15
              *

1033          KK 125A-14
1034          BA   0.443
1035          LS       0      73
1036          UD   0.467
              *

1037          KKC125A-14
1038          KM   COMBINE 125A-14 AND RC125B-4
1039          HC       2
              *

1040          KKRC25A-14
1041          KM   ROUTE C125A-14 TO 125A-16
1042          RD    3200  0.0038    0.05       0    TRAP      10      15
              *
1                                   HEC-1 INPUT                                                PAGE 32

LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


1043          KK 125A-16
1044          BA   0.312
1045          LS       0      76
```

```
1046          UD   0.572
              *

1047          KKC125A-16
1048          KM   COMBINE 125A-16 AND RC25A-14
1049          KM   UPPER LV WASH EAST FLOW @ UPPER LAS VEGAS WASH
1050          HC       2
              *

1051          KK     DP2
1052          KM   COMBINE C125A-16 AND RC25A-15
1053          KM   UPPER LAS VEGAS WASH @ BUFFALO
1054          HC       2
              *

1055          KKRC25A-16
1056          KM   ROUTE 2C25A-16 TO 116-7
1057          KM   FACILITY = UPPER LAS VEGAS WASH
1058          KM   FACILITY ID-MILE = LVUP 0976
1059          KM   LINING = UNLINED
1060          RD    2600  0.0077    0.02       0    TRAP     300       3
              *

1061          KK   116-1
1062          BA   0.402
1063          LS       0      73
1064          UD   0.505
              *

1065          KK  R116-1
1066          KM   ROUTE 116-1 TO 116-7
1067          KM   STREET NAME = TENAYA
1068          RD    3200  0.0078    0.02       0    TRAP      10      15
              *

1069          KK   116-7
1070          BA   0.311
1071          LS       0      73
1072          UD   0.535
              *

1073          KK  C116-7
1074          KM   COMBINE 116-7, R116-1 AND RC25A-16
1075          KM   UPPER LAS VEGAS WASH @ TENAYA
1076          HC       3
              *
```



```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

1077          KK RC116-7
1078          KM   ROUTE C116-7 TO 116-8
1079          KM   FACILITY = UPPER LAS VEGAS WASH
1080          KM   FACILITY ID-MILE = LVUP 0976
1081          KM   LINING = UNLINED
1082          RD    2600  0.0077    0.02       0    TRAP     300       3
              *

1083          KK     118
1084          BA   3.549
1085          LS       0      84
1086          UD   0.520
              *

1087          KK    R118
1088          KM   ROUTE 118 TO 125B-5
1089          KM   NATURAL WASH
1090          KM   TRAVEL LENGTH = 10,500
1091          KM   SLOPE = 5.8%
1092          KM   N = 0.040
1093          KM   HYDRAULIC RADIUS = 1.5
1094          KM   VELOCITY = 13.43
1095          RM       2   0.155    0.15
              *

1096          KK  125B-5
1097          BA   3.120
1098          LS       0      78
1099          UD   0.625
              *
```

```
1100          KK C125B-5
1101          KM   COMBINE 125B-5, R118
1102          HC       2
              *

1103          KKRC125B-5
1104          RD    3200  0.0063    0.05       0    TRAP      10      15
              *

1105          KK   116-2
1106          BA   0.415
1107          LS       0      73
1108          UD   0.526
              *

1109          KK  C116-2
1110          HC       2
              *
```



```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


1111          KK  R116-2
1112          KM   ROUTE 116-2 TO 116-8
1113          KM   STREET NAME = RAINBOW
1114          RD    3200  0.0063    0.05       0    TRAP      10      15
              *

1115          KK   116-8
1116          BA   0.328
1117          LS       0      74
1118          UD   0.580
              *

1119          KK  C116-8
1120          KM   COMBINE 116-8, R116-2 AND RC116-7
1121          KM   UPPER LAS VEGAS WASH @ RAINBOW
1122          HC       3
              *

1123          KK RC116-8
1124          KM   ROUTE C116-8 TO 116-9
1125          KM   FACILITY = UPPER LAS VEGAS WASH
1126          KM   FACILITY ID-MILE = LVUP 0976
1127          KM   LINING = NATURAL WASH
1128          RD    2600  0.0078    0.04       0    TRAP     300       3
              *

1129          KK   116-3
1130          BA   0.403
1131          LS       0      72
1132          UD   0.361
              *

1133          KK  R116-3
1134          KM   ROUTE 116-3 TO 116-9
1135          KM   STREET NAME = TORREY PINES
1136          RD    2600  0.0185    0.05       0    TRAP      10      15
              *

1137          KK   116-9
1138          BA   0.271
1139          LS       0      75
1140          UD   0.699
              *

1141          KK  C116-9
1142          KM   COMBINE 116-9, R116-3 AND RC116-8
1143          KM   UPPER LAS VEGAS WASH @ TORREY PINES
1144          HC       3
              *
```



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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


1145          KK RC116-9
1146          KM   ROUTE C116-9 TO 116-13
1147          KM   FACILITY = UPPER LAS VEGAS WASH
```

```
1148          KM   FACILITY ID-MILE = LVUP 0976
1149          KM   LINING = NATURAL WASH
1150          RD    3400  0.0088    0.04       0    TRAP     300       3
              *

1151          KK   116-4
1152          BA   0.417
1153          LS       0      72
1154          UD   0.327
              *

1155          KK  R116-4
1156          KM   ROUTE 116-4 TO 116-10
1157          KM   STREET NAME = TORREY PINES
1158          RD    2700  0.0296    0.05       0    TRAP      10      15
              *

1159          KK  116-10
1160          BA   0.271
1161          LS       0      75
1162          UD   0.329
              *

1163          KK C116-10
1164          KM   COMBINE 116-10 AND R116-4
1165          HC       2
              *

1166          KK  116-13
1167          BA   0.273
1168          LS       0      72
1169          UD   0.594
              *

1170          KK C116-13
1171          KM   COMBINE 116-13, C116-10 AND RC116-9
1172          HC       3
              *

1173          KKRC116-13
1174          KM   ROUTE C116-13 TO 116-14
1175          KM   FACILITY = UPPER LAS VEGAS WASH
1176          KM   FACILITY ID-MILE = LVUP 0976
1177          KM   LINING = NATURAL WASH
1178          RD    3500  0.0086    0.04       0    TRAP     300       3
              *
```



```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


1179          KK NW187-C
1180          BA   0.259
1181          LS       0      80
1182          UD   0.638
              *

1183          KK     DP3
1184          KM   COMBINE RC116-13, AND NW187-C
1185          HC       2
              *

1186          KK     111
1187          BA   1.479
1188          LS       0      84
1189          UD   0.453
              *

1190          KK    R111
1191          KM   ROUTE 111 TO 117
1192          KM   NATURAL WASH
1193          KM   TRAVEL LENGTH = 8,000
1194          KM   SLOPE = 7.1%
1195          KM   N = 0.040
1196          KM   HYDRAULIC RADIUS = 1.5
1197          KM   VELOCITY = 14.86
1198          RM       1   0.107    0.15
              *

1199          KK     117
1200          BA   2.334
```

```
1201          LS       0      78
1202          UD   0.554
              *

1203          KK    C117
1204          KM   COMBINE R111 AND 117
1205          HC       2
              *

1206          KK
1207          RD    2700  0.0389    0.05       0    TRAP      10      15
              *

1208          KK   116-5
1209          BA   0.418
1210          LS       0      73
1211          UD   0.312
              *
```



```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

1212          KK  C116-5
1213          HC       2
              *

1214          KK  R116-5
1215          KM   ROUTE 116-5 TO 116-11
1216          KM   STREET NAME = JONES
1217          RD    2700  0.0389    0.05       0    TRAP      10      15
              *

1218          KK  116-11
1219          BA   0.270
1220          LS       0      72
1221          UD   0.341
              *

1222          KK C116-11
1223          KM   COMBINE 116-11 AND R116-5
1224          HC       2
              *

1225          KKRC116-11
1226          KM   ROUTE C116-11 TO 116-14
1227          KM   STREET NAME = JONES
1228          RD    3000    0.01    0.05       0    TRAP      10      15
              *

1229          KK   116-6
1230          BA   0.413
1231          LS       0      72
1232          UD   0.297
              *

1233          KK  R116-6
1234          KM   ROUTE 116-6 TO 116-12
1235          KM   STREET NAME = BRADLEY
1236          RD    2700  0.0389    0.05       0    TRAP      10      15
              *

1237          KK     110
1238          BA   3.260
1239          LS       0      85
1240          UD   0.821
              *

1241          KK  116-12
1242          BA   0.265
1243          LS       0      72
1244          UD   0.310
              *
```



```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

1245          KK C116-12
1246          KM   COMBINE 116-12, 110 AND R116-6
1247          HC       3
```

```
                 *

1248             KKRC116-12
1249             KM   ROUTE C116-12 TO 116-14
1250             KM   STREET NAME = BRADLEY
1251             RD    2800  0.0214    0.05       0    TRAP      10      15
                 *

1252             KK  116-14
1253             BA   0.543
1254             LS       0      73
1255             UD   0.412
                 *

1256             KK   ULWIN
1257             KM   COMBINE 116-14, RC116-12, RC116-11 AND RC116-13
1258             KM   TOTAL INFLOW TO THE UPPER LAS VEGAS WASH DETETENTION BASIN
1259             HC       4
1260             KO       1
                 *

1261             KK ULWDBEX
1262             KM   FACILITY ID-MILE = LVUP 0910
1263             KM   STORAGE VOLUME = 1836 ACRE-FEET
1264             KM   OUTLET = 2, 8'X8' RCB
1265             KM   100-YEAR DISCHARGE = 4,260 CFS
1266             KM   SPILLWAY LENGTH = 750'
1267             KM   SPILLWAY HEIGHT = 18'
1268             KM   SPILLWAY CREST ELEVATION = 2374.6'
1269             KM   SPILLWAY TYPE = RCC BROAD CRESTED WEIR
1270             KM   PMF DISCHARGE = 182,000 CFS
1271             KM   TOP OF EMBANKMENT ELEVATION = 2393'
1272             RS    1.00    STOR      -1
                 * NEW SV, SE, & SQ CARDS FROM VTN FINDINGS
                 * OUTLET = 2: 8'X8' RCB
1273             SV     0.0     3.9    18.3    45.2    82.5   128.8   184.3   248.9   322.9   411.7
1274             SV   517.5   637.9   773.1   924.2  1092.8  1282.8  1500.1  1750.0  1836.0  2036.6
1275             SE    2340    2342    2344    2346    2348    2350    2352    2354    2356    2358
1276             SE    2360    2362    2364    2366    2368    2370    2372    2374  2374.6    2376
1277             SQ     0.0   197.1   471.5   735.7   989.7  1233.5  1467.1  1690.5  1903.7  2106.7
1278             SQ  2299.5  2482.1  2654.5  2816.7  2968.6  3110.4  3242.0  3363.4  3397.8  7201.7
                 * ORIGINAL SV CARDS "STARRED" OUT
                 * SV 0      40      75      110     250     500     920     1550    1700    1860
                 * SV 2060   2200    2380    2530    2750    3000    3450    4880    6680
                 * SV 0      47      89      130     295     590     1086    1829    2006    2195
                 * SV 2431   2596    2808    2985    3245    3540    4071    5758    7882
                 * SE 2335   2340    2345    2350    2355    2360    2365    2370    2371    2372
                 * SE 2373   2374    2375    2376    2377    2378    2380    2385    2390
                 * SQ 0      720     1690    2300    2800    3290    3730    4120    4190    4260
                 * SQ 6840   10100   15490   20040   26090   34160   53290   106990  182210
                 * KO 3
                 *
```



```
LINE             ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

1279             KK  RULWDB
1280             KM   ROUTE ULWDB TO CCNW206
1281             KM   FACILITY = UPPER LAS VEGAS WASH
1282             KM   FACILITY ID-MILE = LVUP 0446
1283             KM   LINING = NATURAL WASH
1284             RD    1500   0.009    0.05       0    TRAP     250       3
                 *

1285             KK   SOUTH
1286             BA  14.867
1287             LS       0      80
1288             UD   1.856
                 *

1289             KKS0_RULWDB
1290             HC       2
                 *

1291             KK   R102A
1292             KM   ROUTE NBRULWDB TO 102A
1293             RD    1500   0.009    0.05       0    TRAP     250       3
                 *

1294             KK    102A
```

```
1295          BA   6.273
1296          LS       0      83
1297          UD   0.775
              *

1298          KK  CR102A
1299          KM   COMBINE R102A AND NBRULWDB
1300          HC       2
              *

1301          KK   R102B
1302          KM   ROUTE CR102A TO 102B
1303          RD    1500   0.009    0.05       0    TRAP     250       3
              *

1304          KK    102B
1305          BA   8.885
1306          LS       0      83
1307          UD   0.834
              *

1308          KK  RC102B
1309          KM   COMBINE 102B AND CR102A
1310          HC       2
              *
```



```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


1311          KK  FINISH
1312          RD    1500   0.009    0.05       0    TRAP     250       3
1313          KO       1
              *
1314          ZZ
```

1

```
1****************************************                                                    ****************************************
 *                                      *                                                    *                                      *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *                                                    *    U.S. ARMY CORPS OF ENGINEERS      *
 *               JUN   1998             *                                                    *    HYDROLOGIC ENGINEERING CENTER     *
 *            VERSION 4.1               *                                                    *          609 SECOND STREET           *
 *                                      *                                                    *       DAVIS, CALIFORNIA 95616        *
 *  RUN DATE   18MAR08  TIME  14:27:12  *                                                    *           (916) 756-1104             *
 *                                      *                                                    *                                      *
 ****************************************                                                    ****************************************


                                                X     X  XXXXXXX   XXXXX           X
                                                X     X  X        X     X         XX
                                                X     X  X        X                X
                                                XXXXXXX  XXXX     X        XXXXX   X
                                                X     X  X        X                X
                                                X     X  X        X     X          X
                                                X     X  XXXXXXX   XXXXX          XXX


          THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

          THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
          THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
          NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
          DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL   LOSS RATE:GREEN AND AMPT INFILTRATION
          KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

1                                                   HEC-1 INPUT                                                PAGE  1

          LINE           ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 *** FREE ***
 *** NOLIST ***
1****************************************                                                    ****************************************
 *                                      *                                                    *                                      *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *                                                    *    U.S. ARMY CORPS OF ENGINEERS      *
 *               JUN   1998             *                                                    *    HYDROLOGIC ENGINEERING CENTER     *
 *            VERSION 4.1               *                                                    *          609 SECOND STREET           *
 *                                      *                                                    *       DAVIS, CALIFORNIA 95616        *
 *  RUN DATE   18MAR08  TIME  14:27:12  *                                                    *           (916) 756-1104             *
 *                                      *                                                    *                                      *
 ****************************************                                                    ****************************************


                              KLEINFELDER
                              FEBRUARY 2008
                              BASELINE MODEL

                              DESIGN STORM = 100-YEAR 6-HOUR STORM
                              STORM DISTRIBUTION = SDN5


   10 IO          OUTPUT CONTROL VARIABLES
                        IPRNT           5  PRINT CONTROL
                        IPLOT           0  PLOT CONTROL
                        QSCAL          0.  HYDROGRAPH PLOT SCALE

      IT          HYDROGRAPH TIME DATA
                         NMIN           5  MINUTES IN COMPUTATION INTERVAL
                        IDATE      1    0  STARTING DATE
                        ITIME        0000  STARTING TIME
                           NQ         300  NUMBER OF HYDROGRAPH ORDINATES
                       NDDATE      2    0  ENDING DATE
                       NDTIME        0055  ENDING TIME
                       ICENT          19  CENTURY MARK

                    COMPUTATION INTERVAL     .08 HOURS
                         TOTAL TIME BASE   24.92 HOURS

          ENGLISH UNITS
```

```
              DRAINAGE AREA         SQUARE MILES
              PRECIPITATION DEPTH   INCHES
              LENGTH, ELEVATION     FEET
              FLOW                  CUBIC FEET PER SECOND
              STORAGE VOLUME        ACRE-FEET
              SURFACE AREA          ACRES
              TEMPERATURE           DEGREES FAHRENHEIT

     JP          MULTI-PLAN OPTION
                       NPLAN           1  NUMBER OF PLANS

     JR          MULTI-RATIO OPTION
                     RATIOS OF PRECIPITATION
                   1.00       .87       .74       .57       .44       .26


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


            **************
            *            *
1250 KK     *     ULWIN  *
            *            *
            **************

1254 KO          OUTPUT CONTROL VARIABLES
                       IPRNT           1  PRINT CONTROL
                       IPLOT           0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE

1253 HC          HYDROGRAPH COMBINATION
                       ICOMP           4  NUMBER OF HYDROGRAPHS TO COMBINE

                                                                  ***

*****************************************************************************************************************************************

                                                   HYDROGRAPH AT STATION    ULWIN
                                                        SUM OF  4 HYDROGRAPHS
                                                       PLAN 1,   RATIO =  1.00

*****************************************************************************************************************************************
```

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	8101.	1		1230	151	5.	1		1845	226	0.
1		0005	2	0.	1		0620	77	7445.	1		1235	152	4.	1		1850	227	0.
1		0010	3	0.	1		0625	78	6836.	1		1240	153	4.	1		1855	228	0.
1		0015	4	0.	1		0630	79	6276.	1		1245	154	3.	1		1900	229	0.
1		0020	5	0.	1		0635	80	5763.	1		1250	155	3.	1		1905	230	0.
1		0025	6	0.	1		0640	81	5298.	1		1255	156	2.	1		1910	231	0.
1		0030	7	0.	1		0645	82	4876.	1		1300	157	2.	1		1915	232	0.
1		0035	8	0.	1		0650	83	4491.	1		1305	158	2.	1		1920	233	0.
1		0040	9	0.	1		0655	84	4136.	1		1310	159	2.	1		1925	234	0.
1		0045	10	0.	1		0700	85	3806.	1		1315	160	1.	1		1930	235	0.
1		0050	11	1.	1		0705	86	3502.	1		1320	161	1.	1		1935	236	0.
1		0055	12	2.	1		0710	87	3222.	1		1325	162	1.	1		1940	237	0.
1		0100	13	4.	1		0715	88	2961.	1		1330	163	1.	1		1945	238	0.
1		0105	14	6.	1		0720	89	2719.	1		1335	164	1.	1		1950	239	0.
1		0110	15	9.	1		0725	90	2495.	1		1340	165	1.	1		1955	240	0.
1		0115	16	12.	1		0730	91	2289.	1		1345	166	1.	1		2000	241	0.
1		0120	17	16.	1		0735	92	2100.	1		1350	167	0.	1		2005	242	0.
1		0125	18	20.	1		0740	93	1928.	1		1355	168	0.	1		2010	243	0.
1		0130	19	25.	1		0745	94	1770.	1		1400	169	0.	1		2015	244	0.
1		0135	20	31.	1		0750	95	1624.	1		1405	170	0.	1		2020	245	0.
1		0140	21	38.	1		0755	96	1490.	1		1410	171	0.	1		2025	246	0.
1		0145	22	46.	1		0800	97	1370.	1		1415	172	0.	1		2030	247	0.
1		0150	23	55.	1		0805	98	1260.	1		1420	173	0.	1		2035	248	0.
1		0155	24	65.	1		0810	99	1161.	1		1425	174	0.	1		2040	249	0.
1		0200	25	77.	1		0815	100	1070.	1		1430	175	0.	1		2045	250	0.
1		0205	26	91.	1		0820	101	983.	1		1435	176	0.	1		2050	251	0.
1		0210	27	109.	1		0825	102	901.	1		1440	177	0.	1		2055	252	0.
1		0215	28	131.	1		0830	103	825.	1		1445	178	0.	1		2100	253	0.
1		0220	29	156.	1		0835	104	754.	1		1450	179	0.	1		2105	254	0.
1		0225	30	184.	1		0840	105	688.	1		1455	180	0.	1		2110	255	0.
1		0230	31	215.	1		0845	106	626.	1		1500	181	0.	1		2115	256	0.
1		0235	32	247.	1		0850	107	569.	1		1505	182	0.	1		2120	257	0.
1		0240	33	280.	1		0855	108	516.	1		1510	183	0.	1		2125	258	0.
1		0245	34	312.	1		0900	109	469.	1		1515	184	0.	1		2130	259	0.
1		0250	35	344.	1		0905	110	425.	1		1520	185	0.	1		2135	260	0.

1	0255	36	375.	*	1	0910	111	387.	*	1	1525	186	0.	*	1	2140	261	0.
1	0300	37	410.	*	1	0915	112	352.	*	1	1530	187	0.	*	1	2145	262	0.
1	0305	38	453.	*	1	0920	113	320.	*	1	1535	188	0.	*	1	2150	263	0.
1	0310	39	510.	*	1	0925	114	292.	*	1	1540	189	0.	*	1	2155	264	0.
1	0315	40	588.	*	1	0930	115	266.	*	1	1545	190	0.	*	1	2200	265	0.
1	0320	41	696.	*	1	0935	116	242.	*	1	1550	191	0.	*	1	2205	266	0.
1	0325	42	850.	*	1	0940	117	220.	*	1	1555	192	0.	*	1	2210	267	0.
1	0330	43	1069.	*	1	0945	118	200.	*	1	1600	193	0.	*	1	2215	268	0.
1	0335	44	1378.	*	1	0950	119	181.	*	1	1605	194	0.	*	1	2220	269	0.
1	0340	45	1791.	*	1	0955	120	164.	*	1	1610	195	0.	*	1	2225	270	0.
1	0345	46	2290.	*	1	1000	121	148.	*	1	1615	196	0.	*	1	2230	271	0.
1	0350	47	2833.	*	1	1005	122	134.	*	1	1620	197	0.	*	1	2235	272	0.
1	0355	48	3365.	*	1	1010	123	121.	*	1	1625	198	0.	*	1	2240	273	0.
1	0400	49	3846.	*	1	1015	124	109.	*	1	1630	199	0.	*	1	2245	274	0.
1	0405	50	4350.	*	1	1020	125	98.	*	1	1635	200	0.	*	1	2250	275	0.
1	0410	51	5234.	*	1	1025	126	88.	*	1	1640	201	0.	*	1	2255	276	0.
1	0415	52	6747.	*	1	1030	127	79.	*	1	1645	202	0.	*	1	2300	277	0.
1	0420	53	8887.	*	1	1035	128	71.	*	1	1650	203	0.	*	1	2305	278	0.
1	0425	54	11092.	*	1	1040	129	64.	*	1	1655	204	0.	*	1	2310	279	0.
1	0430	55	12656.	*	1	1045	130	57.	*	1	1700	205	0.	*	1	2315	280	0.
1	0435	56	13496.	*	1	1050	131	51.	*	1	1705	206	0.	*	1	2320	281	0.
1	0440	57	13752.	*	1	1055	132	46.	*	1	1710	207	0.	*	1	2325	282	0.
1	0445	58	13580.	*	1	1100	133	41.	*	1	1715	208	0.	*	1	2330	283	0.
1	0450	59	13224.	*	1	1105	134	37.	*	1	1720	209	0.	*	1	2335	284	0.
1	0455	60	12817.	*	1	1110	135	33.	*	1	1725	210	0.	*	1	2340	285	0.
1	0500	61	12422.	*	1	1115	136	29.	*	1	1730	211	0.	*	1	2345	286	0.
1	0505	62	12106.	*	1	1120	137	26.	*	1	1735	212	0.	*	1	2350	287	0.
1	0510	63	11869.	*	1	1125	138	23.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	11701.	*	1	1130	139	21.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	11582.	*	1	1135	140	19.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	11513.	*	1	1140	141	17.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	11494.	*	1	1145	142	15.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	11496.	*	1	1150	143	13.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	11461.	*	1	1155	144	12.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	11346.	*	1	1200	145	10.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	11094.	*	1	1205	146	9.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	10672.	*	1	1210	147	8.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	10109.	*	1	1215	148	7.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	9466.	*	1	1220	149	6.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	8785.	*	1	1225	150	6.	*	1	1840	225	0.	*	2	0055	300	0.
				*					*					*				

****

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 13752.	4.67		5513.	1405.	1353.	1353.
		(INCHES)	.871	.888	.888	.888
		(AC-FT)	2734.	2787.	2787.	2787.

CUMULATIVE AREA = 58.84 SQ MI

****

HYDROGRAPH AT STATION ULWIN
SUM OF 4 HYDROGRAPHS
PLAN 1, RATIO = .87

****

DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	*	1		0615	76	6688.	*	1		1230	151	7.	*	1		1845	226	0.
1		0005	2	0.	*	1		0620	77	6187.	*	1		1235	152	6.	*	1		1850	227	0.
1		0010	3	0.	*	1		0625	78	5707.	*	1		1240	153	6.	*	1		1855	228	0.
1		0015	4	0.	*	1		0630	79	5259.	*	1		1245	154	5.	*	1		1900	229	0.
1		0020	5	0.	*	1		0635	80	4844.	*	1		1250	155	4.	*	1		1905	230	0.
1		0025	6	0.	*	1		0640	81	4463.	*	1		1255	156	4.	*	1		1910	231	0.
1		0030	7	0.	*	1		0645	82	4116.	*	1		1300	157	3.	*	1		1915	232	0.
1		0035	8	0.	*	1		0650	83	3796.	*	1		1305	158	3.	*	1		1920	233	0.
1		0040	9	0.	*	1		0655	84	3504.	*	1		1310	159	3.	*	1		1925	234	0.
1		0045	10	0.	*	1		0700	85	3235.	*	1		1315	160	2.	*	1		1930	235	0.
1		0050	11	0.	*	1		0705	86	2987.	*	1		1320	161	2.	*	1		1935	236	0.
1		0055	12	0.	*	1		0710	87	2758.	*	1		1325	162	2.	*	1		1940	237	0.
1		0100	13	0.	*	1		0715	88	2545.	*	1		1330	163	2.	*	1		1945	238	0.
1		0105	14	1.	*	1		0720	89	2348.	*	1		1335	164	1.	*	1		1950	239	0.
1		0110	15	1.	*	1		0725	90	2165.	*	1		1340	165	1.	*	1		1955	240	0.
1		0115	16	2.	*	1		0730	91	1996.	*	1		1345	166	1.	*	1		2000	241	0.
1		0120	17	3.	*	1		0735	92	1839.	*	1		1350	167	1.	*	1		2005	242	0.

1	0125	18	4.	*	1	0740	93	1695.	*	1	1355	168	1.	*	1	2010	243	0.
1	0130	19	6.	*	1	0745	94	1563.	*	1	1400	169	1.	*	1	2015	244	0.
1	0135	20	8.	*	1	0750	95	1441.	*	1	1405	170	1.	*	1	2020	245	0.
1	0140	21	11.	*	1	0755	96	1330.	*	1	1410	171	1.	*	1	2025	246	0.
1	0145	22	15.	*	1	0800	97	1228.	*	1	1415	172	0.	*	1	2030	247	0.
1	0150	23	19.	*	1	0805	98	1135.	*	1	1420	173	0.	*	1	2035	248	0.
1	0155	24	25.	*	1	0810	99	1050.	*	1	1425	174	0.	*	1	2040	249	0.
1	0200	25	32.	*	1	0815	100	968.	*	1	1430	175	0.	*	1	2045	250	0.
1	0205	26	41.	*	1	0820	101	890.	*	1	1435	176	0.	*	1	2050	251	0.
1	0210	27	52.	*	1	0825	102	819.	*	1	1440	177	0.	*	1	2055	252	0.
1	0215	28	65.	*	1	0830	103	754.	*	1	1445	178	0.	*	1	2100	253	0.
1	0220	29	79.	*	1	0835	104	694.	*	1	1450	179	0.	*	1	2105	254	0.
1	0225	30	94.	*	1	0840	105	640.	*	1	1455	180	0.	*	1	2110	255	0.
1	0230	31	110.	*	1	0845	106	588.	*	1	1500	181	0.	*	1	2115	256	0.
1	0235	32	126.	*	1	0850	107	540.	*	1	1505	182	0.	*	1	2120	257	0.
1	0240	33	142.	*	1	0855	108	495.	*	1	1510	183	0.	*	1	2125	258	0.
1	0245	34	159.	*	1	0900	109	452.	*	1	1515	184	0.	*	1	2130	259	0.
1	0250	35	175.	*	1	0905	110	411.	*	1	1520	185	0.	*	1	2135	260	0.
1	0255	36	190.	*	1	0910	111	375.	*	1	1525	186	0.	*	1	2140	261	0.
1	0300	37	206.	*	1	0915	112	342.	*	1	1530	187	0.	*	1	2145	262	0.
1	0305	38	224.	*	1	0920	113	312.	*	1	1535	188	0.	*	1	2150	263	0.
1	0310	39	249.	*	1	0925	114	285.	*	1	1540	189	0.	*	1	2155	264	0.
1	0315	40	288.	*	1	0930	115	260.	*	1	1545	190	0.	*	1	2200	265	0.
1	0320	41	349.	*	1	0935	116	238.	*	1	1550	191	0.	*	1	2205	266	0.
1	0325	42	442.	*	1	0940	117	218.	*	1	1555	192	0.	*	1	2210	267	0.
1	0330	43	580.	*	1	0945	118	200.	*	1	1600	193	0.	*	1	2215	268	0.
1	0335	44	785.	*	1	0950	119	183.	*	1	1605	194	0.	*	1	2220	269	0.
1	0340	45	1077.	*	1	0955	120	167.	*	1	1610	195	0.	*	1	2225	270	0.
1	0345	46	1446.	*	1	1000	121	153.	*	1	1615	196	0.	*	1	2230	271	0.
1	0350	47	1860.	*	1	1005	122	140.	*	1	1620	197	0.	*	1	2235	272	0.
1	0355	48	2280.	*	1	1010	123	129.	*	1	1625	198	0.	*	1	2240	273	0.
1	0400	49	2653.	*	1	1015	124	118.	*	1	1630	199	0.	*	1	2245	274	0.
1	0405	50	2960.	*	1	1020	125	108.	*	1	1635	200	0.	*	1	2250	275	0.
1	0410	51	3224.	*	1	1025	126	99.	*	1	1640	201	0.	*	1	2255	276	0.
1	0415	52	3555.	*	1	1030	127	90.	*	1	1645	202	0.	*	1	2300	277	0.
1	0420	53	4472.	*	1	1035	128	82.	*	1	1650	203	0.	*	1	2305	278	0.
1	0425	54	5809.	*	1	1040	129	75.	*	1	1655	204	0.	*	1	2310	279	0.
1	0430	55	7246.	*	1	1045	130	68.	*	1	1700	205	0.	*	1	2315	280	0.
1	0435	56	8454.	*	1	1050	131	62.	*	1	1705	206	0.	*	1	2320	281	0.
1	0440	57	9227.	*	1	1055	132	56.	*	1	1710	207	0.	*	1	2325	282	0.
1	0445	58	9582.	*	1	1100	133	51.	*	1	1715	208	0.	*	1	2330	283	0.
1	0450	59	9666.	*	1	1105	134	46.	*	1	1720	209	0.	*	1	2335	284	0.
1	0455	60	9589.	*	1	1110	135	41.	*	1	1725	210	0.	*	1	2340	285	0.
1	0500	61	9422.	*	1	1115	136	37.	*	1	1730	211	0.	*	1	2345	286	0.
1	0505	62	9236.	*	1	1120	137	34.	*	1	1735	212	0.	*	1	2350	287	0.
1	0510	63	9081.	*	1	1125	138	30.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	8972.	*	1	1130	139	27.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	8902.	*	1	1135	140	24.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	8856.	*	1	1140	141	22.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	8837.	*	1	1145	142	19.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	8837.	*	1	1150	143	17.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	8827.	*	1	1155	144	16.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	8780.	*	1	1200	145	14.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	8651.	*	1	1205	146	13.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	8421.	*	1	1210	147	11.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	8089.	*	1	1215	148	10.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	7670.	*	1	1220	149	9.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	7192.	*	1	1225	150	8.	*	1	1840	225	0.	*	2	0055	300	0.

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PEAK FLOW (CFS)	TIME (HR)	MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
+ 9666.	4.83 (CFS)	4123.	1051.	1012.	1012.
	(INCHES)	.652	.664	.664	.664
	(AC-FT)	2044.	2085.	2085.	2085.

CUMULATIVE AREA = 58.84 SQ MI

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HYDROGRAPH AT STATION ULWIN
SUM OF 4 HYDROGRAPHS
PLAN 1, RATIO = .74

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DA MON HRMN	ORD	FLOW	*	DA MON HRMN	ORD	FLOW	*	DA MON HRMN	ORD	FLOW	*	DA MON HRMN	ORD	FLOW

1	0000	1	0.	*	1	0615	76	5213.	*	1	1230	151	11.	*	1	1845	226	0.
1	0005	2	0.	*	1	0620	77	4870.	*	1	1235	152	10.	*	1	1850	227	0.
1	0010	3	0.	*	1	0625	78	4527.	*	1	1240	153	9.	*	1	1855	228	0.
1	0015	4	0.	*	1	0630	79	4196.	*	1	1245	154	8.	*	1	1900	229	0.
1	0020	5	0.	*	1	0635	80	3882.	*	1	1250	155	7.	*	1	1905	230	0.
1	0025	6	0.	*	1	0640	81	3591.	*	1	1255	156	6.	*	1	1910	231	0.
1	0030	7	0.	*	1	0645	82	3323.	*	1	1300	157	6.	*	1	1915	232	0.
1	0035	8	0.	*	1	0650	83	3076.	*	1	1305	158	5.	*	1	1920	233	0.
1	0040	9	0.	*	1	0655	84	2849.	*	1	1310	159	5.	*	1	1925	234	0.
1	0045	10	0.	*	1	0700	85	2638.	*	1	1315	160	4.	*	1	1930	235	0.
1	0050	11	0.	*	1	0705	86	2445.	*	1	1320	161	4.	*	1	1935	236	0.
1	0055	12	0.	*	1	0710	87	2265.	*	1	1325	162	3.	*	1	1940	237	0.
1	0100	13	0.	*	1	0715	88	2100.	*	1	1330	163	3.	*	1	1945	238	0.
1	0105	14	0.	*	1	0720	89	1948.	*	1	1335	164	3.	*	1	1950	239	0.
1	0110	15	0.	*	1	0725	90	1805.	*	1	1340	165	2.	*	1	1955	240	0.
1	0115	16	0.	*	1	0730	91	1673.	*	1	1345	166	2.	*	1	2000	241	0.
1	0120	17	0.	*	1	0735	92	1549.	*	1	1350	167	2.	*	1	2005	242	0.
1	0125	18	0.	*	1	0740	93	1436.	*	1	1355	168	2.	*	1	2010	243	0.
1	0130	19	0.	*	1	0745	94	1330.	*	1	1400	169	1.	*	1	2015	244	0.
1	0135	20	1.	*	1	0750	95	1232.	*	1	1405	170	1.	*	1	2020	245	0.
1	0140	21	1.	*	1	0755	96	1141.	*	1	1410	171	1.	*	1	2025	246	0.
1	0145	22	2.	*	1	0800	97	1058.	*	1	1415	172	1.	*	1	2030	247	0.
1	0150	23	4.	*	1	0805	98	981.	*	1	1420	173	1.	*	1	2035	248	0.
1	0155	24	6.	*	1	0810	99	910.	*	1	1425	174	1.	*	1	2040	249	0.
1	0200	25	9.	*	1	0815	100	844.	*	1	1430	175	1.	*	1	2045	250	0.
1	0205	26	12.	*	1	0820	101	784.	*	1	1435	176	1.	*	1	2050	251	0.
1	0210	27	17.	*	1	0825	102	728.	*	1	1440	177	0.	*	1	2055	252	0.
1	0215	28	22.	*	1	0830	103	677.	*	1	1445	178	0.	*	1	2100	253	0.
1	0220	29	29.	*	1	0835	104	630.	*	1	1450	179	0.	*	1	2105	254	0.
1	0225	30	38.	*	1	0840	105	587.	*	1	1455	180	0.	*	1	2110	255	0.
1	0230	31	47.	*	1	0845	106	547.	*	1	1500	181	0.	*	1	2115	256	0.
1	0235	32	56.	*	1	0850	107	509.	*	1	1505	182	0.	*	1	2120	257	0.
1	0240	33	66.	*	1	0855	108	474.	*	1	1510	183	0.	*	1	2125	258	0.
1	0245	34	74.	*	1	0900	109	441.	*	1	1515	184	0.	*	1	2130	259	0.
1	0250	35	82.	*	1	0905	110	410.	*	1	1520	185	0.	*	1	2135	260	0.
1	0255	36	89.	*	1	0910	111	382.	*	1	1525	186	0.	*	1	2140	261	0.
1	0300	37	97.	*	1	0915	112	355.	*	1	1530	187	0.	*	1	2145	262	0.
1	0305	38	105.	*	1	0920	113	328.	*	1	1535	188	0.	*	1	2150	263	0.
1	0310	39	114.	*	1	0925	114	301.	*	1	1540	189	0.	*	1	2155	264	0.
1	0315	40	129.	*	1	0930	115	277.	*	1	1545	190	0.	*	1	2200	265	0.
1	0320	41	151.	*	1	0935	116	254.	*	1	1550	191	0.	*	1	2205	266	0.
1	0325	42	189.	*	1	0940	117	234.	*	1	1555	192	0.	*	1	2210	267	0.
1	0330	43	251.	*	1	0945	118	215.	*	1	1600	193	0.	*	1	2215	268	0.
1	0335	44	346.	*	1	0950	119	198.	*	1	1605	194	0.	*	1	2220	269	0.
1	0340	45	501.	*	1	0955	120	182.	*	1	1610	195	0.	*	1	2225	270	0.
1	0345	46	730.	*	1	1000	121	168.	*	1	1615	196	0.	*	1	2230	271	0.
1	0350	47	1015.	*	1	1005	122	155.	*	1	1620	197	0.	*	1	2235	272	0.
1	0355	48	1326.	*	1	1010	123	143.	*	1	1625	198	0.	*	1	2240	273	0.
1	0400	49	1617.	*	1	1015	124	132.	*	1	1630	199	0.	*	1	2245	274	0.
1	0405	50	1844.	*	1	1020	125	122.	*	1	1635	200	0.	*	1	2250	275	0.
1	0410	51	1994.	*	1	1025	126	112.	*	1	1640	201	0.	*	1	2255	276	0.
1	0415	52	2079.	*	1	1030	127	103.	*	1	1645	202	0.	*	1	2300	277	0.
1	0420	53	2123.	*	1	1035	128	95.	*	1	1650	203	0.	*	1	2305	278	0.
1	0425	54	2348.	*	1	1040	129	87.	*	1	1655	204	0.	*	1	2310	279	0.
1	0430	55	3171.	*	1	1045	130	80.	*	1	1700	205	0.	*	1	2315	280	0.
1	0435	56	3990.	*	1	1050	131	74.	*	1	1705	206	0.	*	1	2320	281	0.
1	0440	57	4678.	*	1	1055	132	67.	*	1	1710	207	0.	*	1	2325	282	0.
1	0445	58	5425.	*	1	1100	133	62.	*	1	1715	208	0.	*	1	2330	283	0.
1	0450	59	5907.	*	1	1105	134	56.	*	1	1720	209	0.	*	1	2335	284	0.
1	0455	60	6157.	*	1	1110	135	51.	*	1	1725	210	0.	*	1	2340	285	0.
1	0500	61	6238.	*	1	1115	136	47.	*	1	1730	211	0.	*	1	2345	286	0.
1	0505	62	6262.	*	1	1120	137	43.	*	1	1735	212	0.	*	1	2350	287	0.
1	0510	63	6284.	*	1	1125	138	39.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	6280.	*	1	1130	139	35.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	6273.	*	1	1135	140	32.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	6262.	*	1	1140	141	29.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	6249.	*	1	1145	142	26.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	6249.	*	1	1150	143	24.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	6252.	*	1	1155	144	22.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	6248.	*	1	1200	145	20.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	6228.	*	1	1205	146	18.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	6160.	*	1	1210	147	16.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	6023.	*	1	1215	148	14.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	5812.	*	1	1220	149	13.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	5536.	*	1	1225	150	12.	*	1	1840	225	0.	*	2	0055	300	0.

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PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR

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+   (CFS)       (HR)
                          (CFS)
+    6284.      5.17                2860.        731.        704.         704.
                         (INCHES)     .452        .462        .462         .462
                          (AC-FT)    1418.       1450.       1450.        1450.

                          CUMULATIVE AREA =   58.84 SQ MI
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HYDROGRAPH AT STATION ULWIN
SUM OF 4 HYDROGRAPHS
PLAN 1, RATIO = .57

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DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	3039.	1		1230	151	18.	1		1845	226	0.
1		0005	2	0.	1		0620	77	2944.	1		1235	152	16.	1		1850	227	0.
1		0010	3	0.	1		0625	78	2825.	1		1240	153	15.	1		1855	228	0.
1		0015	4	0.	1		0630	79	2696.	1		1245	154	14.	1		1900	229	0.
1		0020	5	0.	1		0635	80	2548.	1		1250	155	13.	1		1905	230	0.
1		0025	6	0.	1		0640	81	2390.	1		1255	156	12.	1		1910	231	0.
1		0030	7	0.	1		0645	82	2235.	1		1300	157	11.	1		1915	232	0.
1		0035	8	0.	1		0650	83	2083.	1		1305	158	10.	1		1920	233	0.
1		0040	9	0.	1		0655	84	1940.	1		1310	159	9.	1		1925	234	0.
1		0045	10	0.	1		0700	85	1807.	1		1315	160	8.	1		1930	235	0.
1		0050	11	0.	1		0705	86	1685.	1		1320	161	8.	1		1935	236	0.
1		0055	12	0.	1		0710	87	1572.	1		1325	162	7.	1		1940	237	0.
1		0100	13	0.	1		0715	88	1468.	1		1330	163	6.	1		1945	238	0.
1		0105	14	0.	1		0720	89	1372.	1		1335	164	6.	1		1950	239	0.
1		0110	15	0.	1		0725	90	1281.	1		1340	165	5.	1		1955	240	0.
1		0115	16	0.	1		0730	91	1194.	1		1345	166	5.	1		2000	241	0.
1		0120	17	0.	1		0735	92	1113.	1		1350	167	5.	1		2005	242	0.
1		0125	18	0.	1		0740	93	1038.	1		1355	168	4.	1		2010	243	0.
1		0130	19	0.	1		0745	94	968.	1		1400	169	4.	1		2015	244	0.
1		0135	20	0.	1		0750	95	906.	1		1405	170	3.	1		2020	245	0.
1		0140	21	0.	1		0755	96	847.	1		1410	171	3.	1		2025	246	0.
1		0145	22	0.	1		0800	97	792.	1		1415	172	3.	1		2030	247	0.
1		0150	23	0.	1		0805	98	740.	1		1420	173	3.	1		2035	248	0.
1		0155	24	0.	1		0810	99	693.	1		1425	174	2.	1		2040	249	0.
1		0200	25	0.	1		0815	100	649.	1		1430	175	2.	1		2045	250	0.
1		0205	26	0.	1		0820	101	608.	1		1435	176	2.	1		2050	251	0.
1		0210	27	1.	1		0825	102	570.	1		1440	177	2.	1		2055	252	0.
1		0215	28	2.	1		0830	103	534.	1		1445	178	2.	1		2100	253	0.
1		0220	29	3.	1		0835	104	500.	1		1450	179	1.	1		2105	254	0.
1		0225	30	4.	1		0840	105	469.	1		1455	180	1.	1		2110	255	0.
1		0230	31	6.	1		0845	106	440.	1		1500	181	1.	1		2115	256	0.
1		0235	32	8.	1		0850	107	412.	1		1505	182	1.	1		2120	257	0.
1		0240	33	11.	1		0855	108	387.	1		1510	183	1.	1		2125	258	0.
1		0245	34	13.	1		0900	109	363.	1		1515	184	1.	1		2130	259	0.
1		0250	35	15.	1		0905	110	340.	1		1520	185	1.	1		2135	260	0.
1		0255	36	18.	1		0910	111	319.	1		1525	186	1.	1		2140	261	0.
1		0300	37	20.	1		0915	112	300.	1		1530	187	1.	1		2145	262	0.
1		0305	38	23.	1		0920	113	281.	1		1535	188	1.	1		2150	263	0.
1		0310	39	28.	1		0925	114	264.	1		1540	189	0.	1		2155	264	0.
1		0315	40	34.	1		0930	115	248.	1		1545	190	0.	1		2200	265	0.
1		0320	41	43.	1		0935	116	233.	1		1550	191	0.	1		2205	266	0.
1		0325	42	57.	1		0940	117	219.	1		1555	192	0.	1		2210	267	0.
1		0330	43	79.	1		0945	118	205.	1		1600	193	0.	1		2215	268	0.
1		0335	44	113.	1		0950	119	192.	1		1605	194	0.	1		2220	269	0.
1		0340	45	161.	1		0955	120	179.	1		1610	195	0.	1		2225	270	0.
1		0345	46	223.	1		1000	121	165.	1		1615	196	0.	1		2230	271	0.
1		0350	47	299.	1		1005	122	153.	1		1620	197	0.	1		2235	272	0.
1		0355	48	442.	1		1010	123	142.	1		1625	198	0.	1		2240	273	0.
1		0400	49	633.	1		1015	124	131.	1		1630	199	0.	1		2245	274	0.
1		0405	50	805.	1		1020	125	122.	1		1635	200	0.	1		2250	275	0.
1		0410	51	928.	1		1025	126	113.	1		1640	201	0.	1		2255	276	0.
1		0415	52	1012.	1		1030	127	105.	1		1645	202	0.	1		2300	277	0.
1		0420	53	1049.	1		1035	128	97.	1		1650	203	0.	1		2305	278	0.
1		0425	54	1051.	1		1040	129	91.	1		1655	204	0.	1		2310	279	0.
1		0430	55	1030.	1		1045	130	85.	1		1700	205	0.	1		2315	280	0.
1		0435	56	999.	1		1050	131	79.	1		1705	206	0.	1		2320	281	0.
1		0440	57	961.	1		1055	132	74.	1		1710	207	0.	1		2325	282	0.
1		0445	58	1051.	1		1100	133	69.	1		1715	208	0.	1		2330	283	0.
1		0450	59	1839.	1		1105	134	64.	1		1720	209	0.	1		2335	284	0.
1		0455	60	1978.	1		1110	135	60.	1		1725	210	0.	1		2340	285	0.
1		0500	61	2005.	1		1115	136	56.	1		1730	211	0.	1		2345	286	0.
1		0505	62	2421.	1		1120	137	52.	1		1735	212	0.	1		2350	287	0.

1	0510	63	2587.	*	1	1125	138	49.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	2823.	*	1	1130	139	46.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	2933.	*	1	1135	140	42.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	2987.	*	1	1140	141	40.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	2942.	*	1	1145	142	37.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	2986.	*	1	1150	143	34.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	3035.	*	1	1155	144	31.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	3063.	*	1	1200	145	29.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	3155.	*	1	1205	146	27.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	3209.	*	1	1210	147	25.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	3184.	*	1	1215	148	23.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	3146.	*	1	1220	149	21.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	3100.	*	1	1225	150	19.	*	1	1840	225	0.	*	2	0055	300	0.

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PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
+		(CFS)				
+ 3209.	5.92		1461.	377.	363.	363.
		(INCHES)	.231	.239	.239	.239
		(AC-FT)	724.	749.	749.	749.

CUMULATIVE AREA = 58.84 SQ MI

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HYDROGRAPH AT STATION ULWIN
SUM OF 4 HYDROGRAPHS
PLAN 1, RATIO = .44

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DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	1173.	1		1230	151	27.	1		1845	226	0.
1		0005	2	0.	1		0620	77	1183.	1		1235	152	25.	1		1850	227	0.
1		0010	3	0.	1		0625	78	1150.	1		1240	153	24.	1		1855	228	0.
1		0015	4	0.	1		0630	79	1135.	1		1245	154	22.	1		1900	229	0.
1		0020	5	0.	1		0635	80	1159.	1		1250	155	21.	1		1905	230	0.
1		0025	6	0.	1		0640	81	1161.	1		1255	156	20.	1		1910	231	0.
1		0030	7	0.	1		0645	82	1170.	1		1300	157	19.	1		1915	232	0.
1		0035	8	0.	1		0650	83	1150.	1		1305	158	17.	1		1920	233	0.
1		0040	9	0.	1		0655	84	1102.	1		1310	159	16.	1		1925	234	0.
1		0045	10	0.	1		0700	85	1051.	1		1315	160	15.	1		1930	235	0.
1		0050	11	0.	1		0705	86	995.	1		1320	161	14.	1		1935	236	0.
1		0055	12	0.	1		0710	87	958.	1		1325	162	13.	1		1940	237	0.
1		0100	13	0.	1		0715	88	903.	1		1330	163	12.	1		1945	238	0.
1		0105	14	0.	1		0720	89	846.	1		1335	164	12.	1		1950	239	0.
1		0110	15	0.	1		0725	90	799.	1		1340	165	11.	1		1955	240	0.
1		0115	16	0.	1		0730	91	752.	1		1345	166	10.	1		2000	241	0.
1		0120	17	0.	1		0735	92	719.	1		1350	167	9.	1		2005	242	0.
1		0125	18	0.	1		0740	93	674.	1		1355	168	9.	1		2010	243	0.
1		0130	19	0.	1		0745	94	639.	1		1400	169	8.	1		2015	244	0.
1		0135	20	0.	1		0750	95	604.	1		1405	170	8.	1		2020	245	0.
1		0140	21	0.	1		0755	96	574.	1		1410	171	7.	1		2025	246	0.
1		0145	22	0.	1		0800	97	541.	1		1415	172	7.	1		2030	247	0.
1		0150	23	0.	1		0805	98	509.	1		1420	173	6.	1		2035	248	0.
1		0155	24	0.	1		0810	99	482.	1		1425	174	6.	1		2040	249	0.
1		0200	25	0.	1		0815	100	456.	1		1430	175	6.	1		2045	250	0.
1		0205	26	0.	1		0820	101	429.	1		1435	176	5.	1		2050	251	0.
1		0210	27	0.	1		0825	102	404.	1		1440	177	5.	1		2055	252	0.
1		0215	28	0.	1		0830	103	382.	1		1445	178	5.	1		2100	253	0.
1		0220	29	0.	1		0835	104	360.	1		1450	179	4.	1		2105	254	0.
1		0225	30	0.	1		0840	105	340.	1		1455	180	4.	1		2110	255	0.
1		0230	31	0.	1		0845	106	322.	1		1500	181	4.	1		2115	256	0.
1		0235	32	0.	1		0850	107	305.	1		1505	182	3.	1		2120	257	0.
1		0240	33	0.	1		0855	108	289.	1		1510	183	3.	1		2125	258	0.
1		0245	34	0.	1		0900	109	274.	1		1515	184	3.	1		2130	259	0.
1		0250	35	0.	1		0905	110	260.	1		1520	185	3.	1		2135	260	0.
1		0255	36	0.	1		0910	111	246.	1		1525	186	3.	1		2140	261	0.
1		0300	37	1.	1		0915	112	233.	1		1530	187	2.	1		2145	262	0.
1		0305	38	1.	1		0920	113	221.	1		1535	188	2.	1		2150	263	0.
1		0310	39	1.	1		0925	114	210.	1		1540	189	2.	1		2155	264	0.
1		0315	40	2.	1		0930	115	199.	1		1545	190	2.	1		2200	265	0.
1		0320	41	4.	1		0935	116	189.	1		1550	191	2.	1		2205	266	0.
1		0325	42	6.	1		0940	117	181.	1		1555	192	2.	1		2210	267	0.
1		0330	43	12.	1		0945	118	172.	1		1600	193	2.	1		2215	268	0.
1		0335	44	24.	1		0950	119	164.	1		1605	194	2.	1		2220	269	0.

1	0340	45	43.	*	1	0955	120	156.	*	1	1610	195	1.	*	1	2225	270	0.
1	0345	46	69.	*	1	1000	121	148.	*	1	1615	196	1.	*	1	2230	271	0.
1	0350	47	102.	*	1	1005	122	141.	*	1	1620	197	1.	*	1	2235	272	0.
1	0355	48	137.	*	1	1010	123	134.	*	1	1625	198	1.	*	1	2240	273	0.
1	0400	49	174.	*	1	1015	124	127.	*	1	1630	199	1.	*	1	2245	274	0.
1	0405	50	215.	*	1	1020	125	121.	*	1	1635	200	1.	*	1	2250	275	0.
1	0410	51	320.	*	1	1025	126	115.	*	1	1640	201	1.	*	1	2255	276	0.
1	0415	52	425.	*	1	1030	127	110.	*	1	1645	202	1.	*	1	2300	277	0.
1	0420	53	468.	*	1	1035	128	105.	*	1	1650	203	1.	*	1	2305	278	0.
1	0425	54	494.	*	1	1040	129	100.	*	1	1655	204	1.	*	1	2310	279	0.
1	0430	55	498.	*	1	1045	130	95.	*	1	1700	205	1.	*	1	2315	280	0.
1	0435	56	491.	*	1	1050	131	90.	*	1	1705	206	1.	*	1	2320	281	0.
1	0440	57	477.	*	1	1055	132	85.	*	1	1710	207	1.	*	1	2325	282	0.
1	0445	58	459.	*	1	1100	133	80.	*	1	1715	208	1.	*	1	2330	283	0.
1	0450	59	442.	*	1	1105	134	75.	*	1	1720	209	0.	*	1	2335	284	0.
1	0455	60	430.	*	1	1110	135	71.	*	1	1725	210	0.	*	1	2340	285	0.
1	0500	61	425.	*	1	1115	136	67.	*	1	1730	211	0.	*	1	2345	286	0.
1	0505	62	430.	*	1	1120	137	63.	*	1	1735	212	0.	*	1	2350	287	0.
1	0510	63	444.	*	1	1125	138	59.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	810.	*	1	1130	139	55.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	1148.	*	1	1135	140	52.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	780.	*	1	1140	141	49.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	1010.	*	1	1145	142	46.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	1000.	*	1	1150	143	43.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	989.	*	1	1155	144	41.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	1219.	*	1	1200	145	38.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	1172.	*	1	1205	146	36.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	1218.	*	1	1210	147	34.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	1199.	*	1	1215	148	32.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	1278.	*	1	1220	149	30.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	1199.	*	1	1225	150	29.	*	1	1840	225	0.	*	2	0055	300	0.

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
+ 1278.	6.08	(CFS)	645.	172.	166.	166.
		(INCHES)	.102	.109	.109	.109
		(AC-FT)	320.	341.	341.	341.

CUMULATIVE AREA = 58.84 SQ MI

HYDROGRAPH AT STATION ULWIN
SUM OF 4 HYDROGRAPHS
PLAN 1, RATIO = .26

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	71.	1		1230	151	14.	1		1845	226	1.
1		0005	2	0.	1		0620	77	63.	1		1235	152	13.	1		1850	227	1.
1		0010	3	0.	1		0625	78	57.	1		1240	153	12.	1		1855	228	1.
1		0015	4	0.	1		0630	79	51.	1		1245	154	12.	1		1900	229	1.
1		0020	5	0.	1		0635	80	46.	1		1250	155	12.	1		1905	230	1.
1		0025	6	0.	1		0640	81	41.	1		1255	156	11.	1		1910	231	1.
1		0030	7	0.	1		0645	82	37.	1		1300	157	11.	1		1915	232	1.
1		0035	8	0.	1		0650	83	33.	1		1305	158	11.	1		1920	233	0.
1		0040	9	0.	1		0655	84	30.	1		1310	159	10.	1		1925	234	0.
1		0045	10	0.	1		0700	85	27.	1		1315	160	10.	1		1930	235	0.
1		0050	11	0.	1		0705	86	24.	1		1320	161	10.	1		1935	236	0.
1		0055	12	0.	1		0710	87	76.	1		1325	162	10.	1		1940	237	0.
1		0100	13	0.	1		0715	88	123.	1		1330	163	9.	1		1945	238	0.
1		0105	14	0.	1		0720	89	80.	1		1335	164	9.	1		1950	239	0.
1		0110	15	0.	1		0725	90	123.	1		1340	165	9.	1		1955	240	0.
1		0115	16	0.	1		0730	91	84.	1		1345	166	8.	1		2000	241	0.
1		0120	17	0.	1		0735	92	65.	1		1350	167	8.	1		2005	242	0.
1		0125	18	0.	1		0740	93	104.	1		1355	168	8.	1		2010	243	0.
1		0130	19	0.	1		0745	94	60.	1		1400	169	8.	1		2015	244	0.
1		0135	20	0.	1		0750	95	67.	1		1405	170	7.	1		2020	245	0.
1		0140	21	0.	1		0755	96	79.	1		1410	171	7.	1		2025	246	0.
1		0145	22	0.	1		0800	97	46.	1		1415	172	7.	1		2030	247	0.
1		0150	23	0.	1		0805	98	65.	1		1420	173	6.	1		2035	248	0.
1		0155	24	0.	1		0810	99	69.	1		1425	174	6.	1		2040	249	0.
1		0200	25	0.	1		0815	100	66.	1		1430	175	6.	1		2045	250	0.
1		0205	26	0.	1		0820	101	101.	1		1435	176	6.	1		2050	251	0.

1	0210	27	0.	*	1	0825	102	87.	*	1	1440	177	6.	*	1	2055	252	0.
1	0215	28	0.	*	1	0830	103	73.	*	1	1445	178	5.	*	1	2100	253	0.
1	0220	29	0.	*	1	0835	104	72.	*	1	1450	179	5.	*	1	2105	254	0.
1	0225	30	0.	*	1	0840	105	65.	*	1	1455	180	5.	*	1	2110	255	0.
1	0230	31	0.	*	1	0845	106	79.	*	1	1500	181	5.	*	1	2115	256	0.
1	0235	32	0.	*	1	0850	107	69.	*	1	1505	182	4.	*	1	2120	257	0.
1	0240	33	0.	*	1	0855	108	55.	*	1	1510	183	4.	*	1	2125	258	0.
1	0245	34	0.	*	1	0900	109	59.	*	1	1515	184	4.	*	1	2130	259	0.
1	0250	35	0.	*	1	0905	110	58.	*	1	1520	185	4.	*	1	2135	260	0.
1	0255	36	0.	*	1	0910	111	63.	*	1	1525	186	4.	*	1	2140	261	0.
1	0300	37	0.	*	1	0915	112	53.	*	1	1530	187	4.	*	1	2145	262	0.
1	0305	38	0.	*	1	0920	113	44.	*	1	1535	188	3.	*	1	2150	263	0.
1	0310	39	0.	*	1	0925	114	51.	*	1	1540	189	3.	*	1	2155	264	0.
1	0315	40	0.	*	1	0930	115	54.	*	1	1545	190	3.	*	1	2200	265	0.
1	0320	41	0.	*	1	0935	116	51.	*	1	1550	191	3.	*	1	2205	266	0.
1	0325	42	0.	*	1	0940	117	45.	*	1	1555	192	3.	*	1	2210	267	0.
1	0330	43	0.	*	1	0945	118	46.	*	1	1600	193	3.	*	1	2215	268	0.
1	0335	44	0.	*	1	0950	119	51.	*	1	1605	194	3.	*	1	2220	269	0.
1	0340	45	0.	*	1	0955	120	42.	*	1	1610	195	2.	*	1	2225	270	0.
1	0345	46	0.	*	1	1000	121	36.	*	1	1615	196	2.	*	1	2230	271	0.
1	0350	47	0.	*	1	1005	122	39.	*	1	1620	197	2.	*	1	2235	272	0.
1	0355	48	1.	*	1	1010	123	40.	*	1	1625	198	2.	*	1	2240	273	0.
1	0400	49	5.	*	1	1015	124	35.	*	1	1630	199	2.	*	1	2245	274	0.
1	0405	50	11.	*	1	1020	125	32.	*	1	1635	200	2.	*	1	2250	275	0.
1	0410	51	19.	*	1	1025	126	36.	*	1	1640	201	2.	*	1	2255	276	0.
1	0415	52	26.	*	1	1030	127	34.	*	1	1645	202	2.	*	1	2300	277	0.
1	0420	53	32.	*	1	1035	128	28.	*	1	1650	203	2.	*	1	2305	278	0.
1	0425	54	36.	*	1	1040	129	28.	*	1	1655	204	2.	*	1	2310	279	0.
1	0430	55	40.	*	1	1045	130	31.	*	1	1700	205	2.	*	1	2315	280	0.
1	0435	56	43.	*	1	1050	131	27.	*	1	1705	206	2.	*	1	2320	281	0.
1	0440	57	44.	*	1	1055	132	24.	*	1	1710	207	2.	*	1	2325	282	0.
1	0445	58	45.	*	1	1100	133	26.	*	1	1715	208	2.	*	1	2330	283	0.
1	0450	59	53.	*	1	1105	134	26.	*	1	1720	209	1.	*	1	2335	284	0.
1	0455	60	71.	*	1	1110	135	22.	*	1	1725	210	1.	*	1	2340	285	0.
1	0500	61	67.	*	1	1115	136	21.	*	1	1730	211	1.	*	1	2345	286	0.
1	0505	62	68.	*	1	1120	137	22.	*	1	1735	212	1.	*	1	2350	287	0.
1	0510	63	75.	*	1	1125	138	21.	*	1	1740	213	1.	*	1	2355	288	0.
1	0515	64	75.	*	1	1130	139	19.	*	1	1745	214	1.	*	2	0000	289	0.
1	0520	65	80.	*	1	1135	140	19.	*	1	1750	215	1.	*	2	0005	290	0.
1	0525	66	83.	*	1	1140	141	20.	*	1	1755	216	1.	*	2	0010	291	0.
1	0530	67	87.	*	1	1145	142	18.	*	1	1800	217	1.	*	2	0015	292	0.
1	0535	68	92.	*	1	1150	143	16.	*	1	1805	218	1.	*	2	0020	293	0.
1	0540	69	98.	*	1	1155	144	17.	*	1	1810	219	1.	*	2	0025	294	0.
1	0545	70	104.	*	1	1200	145	17.	*	1	1815	220	1.	*	2	0030	295	0.
1	0550	71	104.	*	1	1205	146	15.	*	1	1820	221	1.	*	2	0035	296	0.
1	0555	72	100.	*	1	1210	147	15.	*	1	1825	222	1.	*	2	0040	297	0.
1	0600	73	94.	*	1	1215	148	15.	*	1	1830	223	1.	*	2	0045	298	0.
1	0605	74	87.	*	1	1220	149	14.	*	1	1835	224	1.	*	2	0050	299	0.
1	0610	75	79.	*	1	1225	150	13.	*	1	1840	225	1.	*	2	0055	300	0.
				*					*					*				

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 123.	7.25		64.	19.	19.	19.
		(INCHES)	.010	.012	.012	.012
		(AC-FT)	32.	39.	39.	39.

CUMULATIVE AREA = 58.84 SQ MI

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              **************
              *            *
 1305 KK      *   FINISH   *
              *            *
              **************

 1307 KO          OUTPUT CONTROL VARIABLES
                        IPRNT          1  PRINT CONTROL
                        IPLOT          0  PLOT CONTROL
                        QSCAL         0.  HYDROGRAPH PLOT SCALE

                  HYDROGRAPH ROUTING DATA
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1306 RD MUSKINGUM-CUNGE CHANNEL ROUTING

L	1500.	CHANNEL LENGTH
S	.0090	SLOPE
N	.050	CHANNEL ROUGHNESS COEFFICIENT
CA	.00	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	250.00	BOTTOM WIDTH OR DIAMETER
Z	3.00	SIDE SLOPE

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COMPUTED MUSKINGUM-CUNGE PARAMETERS

ELEMENT	ALPHA	M	COMPUTATION TIME STEP DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	.08	1.64	2.60	750.00	9675.12	325.30	.98	9.61
INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL								
MAIN	.08	1.64	5.00		9672.78	325.00	.98	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4665E+04 EXCESS= .0000E+00 OUTFLOW= .4665E+04 BASIN STORAGE= .9672E-02 PERCENT ERROR= .0

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HYDROGRAPH AT STATION FINISH
PLAN 1, RATIO = 1.00

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DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	7829.	1		1230	151	2593.	1		1845	226	73.
1		0005	2	0.	1		0620	77	7608.	1		1235	152	2569.	1		1850	227	55.
1		0010	3	0.	1		0625	78	7394.	1		1240	153	2545.	1		1855	228	41.
1		0015	4	0.	1		0630	79	7185.	1		1245	154	2521.	1		1900	229	31.
1		0020	5	0.	1		0635	80	6982.	1		1250	155	2497.	1		1905	230	23.
1		0025	6	0.	1		0640	81	6783.	1		1255	156	2471.	1		1910	231	18.
1		0030	7	0.	1		0645	82	6590.	1		1300	157	2445.	1		1915	232	13.
1		0035	8	0.	1		0650	83	6405.	1		1305	158	2419.	1		1920	233	10.
1		0040	9	0.	1		0655	84	6227.	1		1310	159	2393.	1		1925	234	8.
1		0045	10	0.	1		0700	85	6055.	1		1315	160	2368.	1		1930	235	6.
1		0050	11	1.	1		0705	86	5890.	1		1320	161	2342.	1		1935	236	4.
1		0055	12	2.	1		0710	87	5733.	1		1325	162	2317.	1		1940	237	3.
1		0100	13	3.	1		0715	88	5584.	1		1330	163	2290.	1		1945	238	2.
1		0105	14	6.	1		0720	89	5441.	1		1335	164	2262.	1		1950	239	2.
1		0110	15	10.	1		0725	90	5305.	1		1340	165	2234.	1		1955	240	1.
1		0115	16	16.	1		0730	91	5174.	1		1345	166	2206.	1		2000	241	1.
1		0120	17	24.	1		0735	92	5047.	1		1350	167	2178.	1		2005	242	1.
1		0125	18	33.	1		0740	93	4925.	1		1355	168	2150.	1		2010	243	1.
1		0130	19	44.	1		0745	94	4808.	1		1400	169	2122.	1		2015	244	0.
1		0135	20	58.	1		0750	95	4698.	1		1405	170	2093.	1		2020	245	0.
1		0140	21	75.	1		0755	96	4594.	1		1410	171	2061.	1		2025	246	0.
1		0145	22	97.	1		0800	97	4498.	1		1415	172	2030.	1		2030	247	0.
1		0150	23	124.	1		0805	98	4409.	1		1420	173	1998.	1		2035	248	0.
1		0155	24	158.	1		0810	99	4326.	1		1425	174	1967.	1		2040	249	0.
1		0200	25	197.	1		0815	100	4249.	1		1430	175	1936.	1		2045	250	0.
1		0205	26	243.	1		0820	101	4177.	1		1435	176	1905.	1		2050	251	0.
1		0210	27	294.	1		0825	102	4108.	1		1440	177	1871.	1		2055	252	0.
1		0215	28	351.	1		0830	103	4044.	1		1445	178	1835.	1		2100	253	0.
1		0220	29	411.	1		0835	104	3984.	1		1450	179	1800.	1		2105	254	0.
1		0225	30	473.	1		0840	105	3927.	1		1455	180	1765.	1		2110	255	0.
1		0230	31	535.	1		0845	106	3873.	1		1500	181	1731.	1		2115	256	0.
1		0235	32	594.	1		0850	107	3822.	1		1505	182	1697.	1		2120	257	0.
1		0240	33	649.	1		0855	108	3773.	1		1510	183	1660.	1		2125	258	0.
1		0245	34	700.	1		0900	109	3728.	1		1515	184	1623.	1		2130	259	0.
1		0250	35	747.	1		0905	110	3684.	1		1520	185	1586.	1		2135	260	0.
1		0255	36	795.	1		0910	111	3641.	1		1525	186	1550.	1		2140	261	0.
1		0300	37	850.	1		0915	112	3601.	1		1530	187	1514.	1		2145	262	0.
1		0305	38	918.	1		0920	113	3562.	1		1535	188	1478.	1		2150	263	0.
1		0310	39	1004.	1		0925	114	3526.	1		1540	189	1440.	1		2155	264	0.
1		0315	40	1124.	1		0930	115	3491.	1		1545	190	1402.	1		2200	265	0.
1		0320	41	1302.	1		0935	116	3458.	1		1550	191	1363.	1		2205	266	0.
1		0325	42	1558.	1		0940	117	3427.	1		1555	192	1326.	1		2210	267	0.
1		0330	43	1914.	1		0945	118	3396.	1		1600	193	1289.	1		2215	268	0.

1	0335	44	2400.	*	1	0950	119	3367.	*	1	1605	194	1252.	*	1	2220	269	0.
1	0340	45	3008.	*	1	0955	120	3339.	*	1	1610	195	1214.	*	1	2225	270	0.
1	0345	46	3702.	*	1	1000	121	3311.	*	1	1615	196	1175.	*	1	2230	271	0.
1	0350	47	4450.	*	1	1005	122	3283.	*	1	1620	197	1135.	*	1	2235	272	0.
1	0355	48	5220.	*	1	1010	123	3255.	*	1	1625	198	1096.	*	1	2240	273	0.
1	0400	49	5952.	*	1	1015	124	3228.	*	1	1630	199	1059.	*	1	2245	274	0.
1	0405	50	6582.	*	1	1020	125	3202.	*	1	1635	200	1022.	*	1	2250	275	0.
1	0410	51	7088.	*	1	1025	126	3176.	*	1	1640	201	985.	*	1	2255	276	0.
1	0415	52	7478.	*	1	1030	127	3152.	*	1	1645	202	946.	*	1	2300	277	0.
1	0420	53	7763.	*	1	1035	128	3128.	*	1	1650	203	906.	*	1	2305	278	0.
1	0425	54	7959.	*	1	1040	129	3105.	*	1	1655	204	867.	*	1	2310	279	0.
1	0430	55	8092.	*	1	1045	130	3082.	*	1	1700	205	830.	*	1	2315	280	0.
1	0435	56	8197.	*	1	1050	131	3058.	*	1	1705	206	794.	*	1	2320	281	0.
1	0440	57	8292.	*	1	1055	132	3034.	*	1	1710	207	759.	*	1	2325	282	0.
1	0445	58	8378.	*	1	1100	133	3010.	*	1	1715	208	721.	*	1	2330	283	0.
1	0450	59	8482.	*	1	1105	134	2987.	*	1	1720	209	682.	*	1	2335	284	0.
1	0455	60	8637.	*	1	1110	135	2964.	*	1	1725	210	643.	*	1	2340	285	0.
1	0500	61	8842.	*	1	1115	136	2942.	*	1	1730	211	605.	*	1	2345	286	0.
1	0505	62	9065.	*	1	1120	137	2920.	*	1	1735	212	569.	*	1	2350	287	0.
1	0510	63	9282.	*	1	1125	138	2898.	*	1	1740	213	535.	*	1	2355	288	0.
1	0515	64	9474.	*	1	1130	139	2875.	*	1	1745	214	501.	*	2	0000	289	0.
1	0520	65	9612.	*	1	1135	140	2853.	*	1	1750	215	463.	*	2	0005	290	0.
1	0525	66	9673.	*	1	1140	141	2829.	*	1	1755	216	420.	*	2	0010	291	0.
1	0530	67	9658.	*	1	1145	142	2805.	*	1	1800	217	375.	*	2	0015	292	0.
1	0535	68	9577.	*	1	1150	143	2782.	*	1	1805	218	334.	*	2	0020	293	0.
1	0540	69	9441.	*	1	1155	144	2759.	*	1	1810	219	297.	*	2	0025	294	0.
1	0545	70	9258.	*	1	1200	145	2736.	*	1	1815	220	264.	*	2	0030	295	0.
1	0550	71	9041.	*	1	1205	146	2714.	*	1	1820	221	232.	*	2	0035	296	0.
1	0555	72	8804.	*	1	1210	147	2691.	*	1	1825	222	198.	*	2	0040	297	0.
1	0600	73	8557.	*	1	1215	148	2667.	*	1	1830	223	162.	*	2	0045	298	0.
1	0605	74	8306.	*	1	1220	149	2643.	*	1	1835	224	127.	*	2	0050	299	0.
1	0610	75	8061.	*	1	1225	150	2618.	*	1	1840	225	97.	*	2	0055	300	0.

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PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
+		(CFS)				
+ 9673.	5.42		6255.	2352.	2266.	2266.
		(INCHES)	.654	.984	.984	.984
		(AC-FT)	3101.	4665.	4665.	4665.

CUMULATIVE AREA = 88.86 SQ MI

COMPUTED MUSKINGUM-CUNGE PARAMETERS

ELEMENT	ALPHA	M	COMPUTATION TIME STEP DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	.08	1.64	2.82	750.00	7845.69	330.39	.75	8.85

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

MAIN	.08	1.64	5.00		7845.68	330.00	.75	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3540E+04 EXCESS= .0000E+00 OUTFLOW= .3540E+04 BASIN STORAGE= .1124E-01 PERCENT ERROR= .0

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HYDROGRAPH AT STATION FINISH
PLAN 1, RATIO = .87

****

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	6549.	1		1230	151	1920.	1		1845	226	0.
1		0005	2	0.	1		0620	77	6386.	1		1235	152	1885.	1		1850	227	0.
1		0010	3	0.	1		0625	78	6228.	1		1240	153	1848.	1		1855	228	0.
1		0015	4	0.	1		0630	79	6070.	1		1245	154	1812.	1		1900	229	0.
1		0020	5	0.	1		0635	80	5915.	1		1250	155	1776.	1		1905	230	0.
1		0025	6	0.	1		0640	81	5762.	1		1255	156	1741.	1		1910	231	0.
1		0030	7	0.	1		0645	82	5612.	1		1300	157	1705.	1		1915	232	0.
1		0035	8	0.	1		0650	83	5467.	1		1305	158	1668.	1		1920	233	0.

1	0040	9	0.	*	1	0655	84	5327.	*	1	1310	159	1630.	*	1	1925	234	0.
1	0045	10	0.	*	1	0700	85	5192.	*	1	1315	160	1592.	*	1	1930	235	0.
1	0050	11	0.	*	1	0705	86	5062.	*	1	1320	161	1555.	*	1	1935	236	0.
1	0055	12	0.	*	1	0710	87	4937.	*	1	1325	162	1519.	*	1	1940	237	0.
1	0100	13	0.	*	1	0715	88	4817.	*	1	1330	163	1482.	*	1	1945	238	0.
1	0105	14	0.	*	1	0720	89	4703.	*	1	1335	164	1444.	*	1	1950	239	0.
1	0110	15	0.	*	1	0725	90	4593.	*	1	1340	165	1405.	*	1	1955	240	0.
1	0115	16	1.	*	1	0730	91	4487.	*	1	1345	166	1366.	*	1	2000	241	0.
1	0120	17	2.	*	1	0735	92	4384.	*	1	1350	167	1328.	*	1	2005	242	0.
1	0125	18	4.	*	1	0740	93	4284.	*	1	1355	168	1291.	*	1	2010	243	0.
1	0130	19	6.	*	1	0745	94	4189.	*	1	1400	169	1254.	*	1	2015	244	0.
1	0135	20	11.	*	1	0750	95	4098.	*	1	1405	170	1215.	*	1	2020	245	0.
1	0140	21	17.	*	1	0755	96	4012.	*	1	1410	171	1176.	*	1	2025	246	0.
1	0145	22	26.	*	1	0800	97	3932.	*	1	1415	172	1136.	*	1	2030	247	0.
1	0150	23	39.	*	1	0805	98	3857.	*	1	1420	173	1097.	*	1	2035	248	0.
1	0155	24	55.	*	1	0810	99	3787.	*	1	1425	174	1060.	*	1	2040	249	0.
1	0200	25	77.	*	1	0815	100	3722.	*	1	1430	175	1023.	*	1	2045	250	0.
1	0205	26	103.	*	1	0820	101	3660.	*	1	1435	176	985.	*	1	2050	251	0.
1	0210	27	133.	*	1	0825	102	3600.	*	1	1440	177	946.	*	1	2055	252	0.
1	0215	28	168.	*	1	0830	103	3542.	*	1	1445	178	906.	*	1	2100	253	0.
1	0220	29	206.	*	1	0835	104	3488.	*	1	1450	179	867.	*	1	2105	254	0.
1	0225	30	246.	*	1	0840	105	3436.	*	1	1455	180	830.	*	1	2110	255	0.
1	0230	31	287.	*	1	0845	106	3386.	*	1	1500	181	794.	*	1	2115	256	0.
1	0235	32	327.	*	1	0850	107	3338.	*	1	1505	182	759.	*	1	2120	257	0.
1	0240	33	365.	*	1	0855	108	3293.	*	1	1510	183	721.	*	1	2125	258	0.
1	0245	34	399.	*	1	0900	109	3249.	*	1	1515	184	682.	*	1	2130	259	0.
1	0250	35	430.	*	1	0905	110	3208.	*	1	1520	185	643.	*	1	2135	260	0.
1	0255	36	461.	*	1	0910	111	3168.	*	1	1525	186	606.	*	1	2140	261	0.
1	0300	37	496.	*	1	0915	112	3129.	*	1	1530	187	570.	*	1	2145	262	0.
1	0305	38	540.	*	1	0920	113	3092.	*	1	1535	188	537.	*	1	2150	263	0.
1	0310	39	601.	*	1	0925	114	3055.	*	1	1540	189	503.	*	1	2155	264	0.
1	0315	40	686.	*	1	0930	115	3019.	*	1	1545	190	467.	*	1	2200	265	0.
1	0320	41	811.	*	1	0935	116	2984.	*	1	1550	191	427.	*	1	2205	266	0.
1	0325	42	996.	*	1	0940	117	2950.	*	1	1555	192	384.	*	1	2210	267	0.
1	0330	43	1254.	*	1	0945	118	2917.	*	1	1600	193	342.	*	1	2215	268	0.
1	0335	44	1603.	*	1	0950	119	2886.	*	1	1605	194	305.	*	1	2220	269	0.
1	0340	45	2041.	*	1	0955	120	2855.	*	1	1610	195	271.	*	1	2225	270	0.
1	0345	46	2561.	*	1	1000	121	2824.	*	1	1615	196	240.	*	1	2230	271	0.
1	0350	47	3146.	*	1	1005	122	2793.	*	1	1620	197	208.	*	1	2235	272	0.
1	0355	48	3769.	*	1	1010	123	2762.	*	1	1625	198	172.	*	1	2240	273	0.
1	0400	49	4383.	*	1	1015	124	2731.	*	1	1630	199	137.	*	1	2245	274	0.
1	0405	50	4915.	*	1	1020	125	2701.	*	1	1635	200	105.	*	1	2250	275	0.
1	0410	51	5341.	*	1	1025	126	2671.	*	1	1640	201	80.	*	1	2255	276	0.
1	0415	52	5678.	*	1	1030	127	2642.	*	1	1645	202	60.	*	1	2300	277	0.
1	0420	53	5931.	*	1	1035	128	2614.	*	1	1650	203	46.	*	1	2305	278	0.
1	0425	54	6097.	*	1	1040	129	2586.	*	1	1655	204	34.	*	1	2310	279	0.
1	0430	55	6196.	*	1	1045	130	2557.	*	1	1700	205	26.	*	1	2315	280	0.
1	0435	56	6267.	*	1	1050	131	2528.	*	1	1705	206	20.	*	1	2320	281	0.
1	0440	57	6342.	*	1	1055	132	2498.	*	1	1710	207	15.	*	1	2325	282	0.
1	0445	58	6433.	*	1	1100	133	2469.	*	1	1715	208	11.	*	1	2330	283	0.
1	0450	59	6560.	*	1	1105	134	2441.	*	1	1720	209	9.	*	1	2335	284	0.
1	0455	60	6739.	*	1	1110	135	2413.	*	1	1725	210	7.	*	1	2340	285	0.
1	0500	61	6957.	*	1	1115	136	2385.	*	1	1730	211	5.	*	1	2345	286	0.
1	0505	62	7185.	*	1	1120	137	2356.	*	1	1735	212	4.	*	1	2350	287	0.
1	0510	63	7404.	*	1	1125	138	2327.	*	1	1740	213	3.	*	1	2355	288	0.
1	0515	64	7597.	*	1	1130	139	2297.	*	1	1745	214	2.	*	2	0000	289	0.
1	0520	65	7743.	*	1	1135	140	2267.	*	1	1750	215	2.	*	2	0005	290	0.
1	0525	66	7826.	*	1	1140	141	2237.	*	1	1755	216	1.	*	2	0010	291	0.
1	0530	67	7846.	*	1	1145	142	2207.	*	1	1800	217	1.	*	2	0015	292	0.
1	0535	68	7807.	*	1	1150	143	2178.	*	1	1805	218	1.	*	2	0020	293	0.
1	0540	69	7721.	*	1	1155	144	2148.	*	1	1810	219	1.	*	2	0025	294	0.
1	0545	70	7597.	*	1	1200	145	2117.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	7443.	*	1	1205	146	2084.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	7271.	*	1	1210	147	2051.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	7089.	*	1	1215	148	2018.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	6904.	*	1	1220	149	1986.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	6721.	*	1	1225	150	1954.	*	1	1840	225	0.	*	2	0055	300	0.
				*					*					*				

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 7846.	5.50		5148.	1785.	1719.	1719.
		(INCHES)	.539	.747	.747	.747
		(AC-FT)	2553.	3540.	3540.	3540.

CUMULATIVE AREA = 88.86 SQ MI

COMPUTED MUSKINGUM-CUNGE PARAMETERS

ELEMENT	ALPHA	COMPUTATION TIME STEP M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	.08	1.64	3.14	750.00	5974.39	332.80	.53	7.96

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

MAIN	.08	1.64	5.00		5968.10	335.00	.53	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2510E+04 EXCESS= .0000E+00 OUTFLOW= .2510E+04 BASIN STORAGE= .1100E-01 PERCENT ERROR= .0

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HYDROGRAPH AT STATION FINISH
PLAN 1, RATIO = .74

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DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	5169.	1		1230	151	1067.	1		1845	226	0.
1		0005	2	0.	1		0620	77	5060.	1		1235	152	1029.	1		1850	227	0.
1		0010	3	0.	1		0625	78	4953.	1		1240	153	991.	1		1855	228	0.
1		0015	4	0.	1		0630	79	4844.	1		1245	154	951.	1		1900	229	0.
1		0020	5	0.	1		0635	80	4736.	1		1250	155	911.	1		1905	230	0.
1		0025	6	0.	1		0640	81	4629.	1		1255	156	872.	1		1910	231	0.
1		0030	7	0.	1		0645	82	4522.	1		1300	157	835.	1		1915	232	0.
1		0035	8	0.	1		0650	83	4417.	1		1305	158	798.	1		1920	233	0.
1		0040	9	0.	1		0655	84	4315.	1		1310	159	762.	1		1925	234	0.
1		0045	10	0.	1		0700	85	4216.	1		1315	160	724.	1		1930	235	0.
1		0050	11	0.	1		0705	86	4119.	1		1320	161	685.	1		1935	236	0.
1		0055	12	0.	1		0710	87	4025.	1		1325	162	646.	1		1940	237	0.
1		0100	13	0.	1		0715	88	3935.	1		1330	163	608.	1		1945	238	0.
1		0105	14	0.	1		0720	89	3848.	1		1335	164	573.	1		1950	239	0.
1		0110	15	0.	1		0725	90	3763.	1		1340	165	539.	1		1955	240	0.
1		0115	16	0.	1		0730	91	3681.	1		1345	166	506.	1		2000	241	0.
1		0120	17	0.	1		0735	92	3600.	1		1350	167	471.	1		2005	242	0.
1		0125	18	0.	1		0740	93	3522.	1		1355	168	433.	1		2010	243	0.
1		0130	19	0.	1		0745	94	3446.	1		1400	169	392.	1		2015	244	0.
1		0135	20	0.	1		0750	95	3373.	1		1405	170	353.	1		2020	245	0.
1		0140	21	1.	1		0755	96	3303.	1		1410	171	316.	1		2025	246	0.
1		0145	22	2.	1		0800	97	3238.	1		1415	172	283.	1		2030	247	0.
1		0150	23	4.	1		0805	98	3176.	1		1420	173	251.	1		2035	248	0.
1		0155	24	8.	1		0810	99	3117.	1		1425	174	221.	1		2040	249	0.
1		0200	25	14.	1		0815	100	3062.	1		1430	175	187.	1		2045	250	0.
1		0205	26	23.	1		0820	101	3009.	1		1435	176	152.	1		2050	251	0.
1		0210	27	35.	1		0825	102	2957.	1		1440	177	119.	1		2055	252	0.
1		0215	28	49.	1		0830	103	2906.	1		1445	178	91.	1		2100	253	0.
1		0220	29	68.	1		0835	104	2857.	1		1450	179	70.	1		2105	254	0.
1		0225	30	88.	1		0840	105	2810.	1		1455	180	53.	1		2110	255	0.
1		0230	31	110.	1		0845	106	2765.	1		1500	181	40.	1		2115	256	0.
1		0235	32	133.	1		0850	107	2721.	1		1505	182	31.	1		2120	257	0.
1		0240	33	155.	1		0855	108	2679.	1		1510	183	24.	1		2125	258	0.
1		0245	34	176.	1		0900	109	2638.	1		1515	184	18.	1		2130	259	0.
1		0250	35	195.	1		0905	110	2598.	1		1520	185	14.	1		2135	260	0.
1		0255	36	214.	1		0910	111	2559.	1		1525	186	11.	1		2140	261	0.
1		0300	37	235.	1		0915	112	2521.	1		1530	187	8.	1		2145	262	0.
1		0305	38	261.	1		0920	113	2482.	1		1535	188	6.	1		2150	263	0.
1		0310	39	297.	1		0925	114	2444.	1		1540	189	5.	1		2155	264	0.
1		0315	40	347.	1		0930	115	2407.	1		1545	190	4.	1		2200	265	0.
1		0320	41	418.	1		0935	116	2371.	1		1550	191	3.	1		2205	266	0.
1		0325	42	530.	1		0940	117	2336.	1		1555	192	2.	1		2210	267	0.
1		0330	43	688.	1		0945	118	2302.	1		1600	193	2.	1		2215	268	0.
1		0335	44	923.	1		0950	119	2268.	1		1605	194	1.	1		2220	269	0.
1		0340	45	1235.	1		0955	120	2233.	1		1610	195	1.	1		2225	270	0.
1		0345	46	1608.	1		1000	121	2197.	1		1615	196	1.	1		2230	271	0.
1		0350	47	2032.	1		1005	122	2160.	1		1620	197	1.	1		2235	272	0.
1		0355	48	2485.	1		1010	123	2124.	1		1625	198	1.	1		2240	273	0.
1		0400	49	2932.	1		1015	124	2088.	1		1630	199	0.	1		2245	274	0.
1		0405	50	3338.	1		1020	125	2053.	1		1635	200	0.	1		2250	275	0.
1		0410	51	3689.	1		1025	126	2019.	1		1640	201	0.	1		2255	276	0.
1		0415	52	3981.	1		1030	127	1983.	1		1645	202	0.	1		2300	277	0.
1		0420	53	4204.	1		1035	128	1946.	1		1650	203	0.	1		2305	278	0.
1		0425	54	4354.	1		1040	129	1908.	1		1655	204	0.	1		2310	279	0.

1	0430	55	4442.	*	1	1045	130	1870.	*	1	1700	205	0.	*	1	2315	280	0.
1	0435	56	4491.	*	1	1050	131	1833.	*	1	1705	206	0.	*	1	2320	281	0.
1	0440	57	4525.	*	1	1055	132	1797.	*	1	1710	207	0.	*	1	2325	282	0.
1	0445	58	4574.	*	1	1100	133	1760.	*	1	1715	208	0.	*	1	2330	283	0.
1	0450	59	4661.	*	1	1105	134	1722.	*	1	1720	209	0.	*	1	2335	284	0.
1	0455	60	4803.	*	1	1110	135	1684.	*	1	1725	210	0.	*	1	2340	285	0.
1	0500	61	4999.	*	1	1115	136	1645.	*	1	1730	211	0.	*	1	2345	286	0.
1	0505	62	5221.	*	1	1120	137	1607.	*	1	1735	212	0.	*	1	2350	287	0.
1	0510	63	5439.	*	1	1125	138	1570.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	5639.	*	1	1130	139	1533.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	5801.	*	1	1135	140	1495.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	5908.	*	1	1140	141	1456.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	5962.	*	1	1145	142	1416.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	5968.	*	1	1150	143	1377.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	5933.	*	1	1155	144	1339.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	5861.	*	1	1200	145	1301.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	5765.	*	1	1205	146	1263.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	5652.	*	1	1210	147	1224.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	5532.	*	1	1215	148	1184.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	5408.	*	1	1220	149	1144.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	5285.	*	1	1225	150	1105.	*	1	1840	225	0.	*	2	0055	300	0.

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PEAK FLOW (CFS)	TIME (HR)	MAXIMUM AVERAGE FLOW (CFS)	6-HR	24-HR	72-HR	24.92-HR
+ 5968.	5.58		3978.	1266.	1219.	1219.
		(INCHES)	.416	.530	.530	.530
		(AC-FT)	1973.	2510.	2510.	2510.

CUMULATIVE AREA = 88.86 SQ MI

COMPUTED MUSKINGUM-CUNGE PARAMETERS

ELEMENT	ALPHA	M	COMPUTATION TIME STEP DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	.08	1.64	3.88	750.00	3458.31	341.73	.28	6.44
INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL								
MAIN	.08	1.64	5.00		3457.73	340.00	.28	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1350E+04 EXCESS= .0000E+00 OUTFLOW= .1350E+04 BASIN STORAGE= .1100E-01 PERCENT ERROR= .0

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HYDROGRAPH AT STATION FINISH
PLAN 1, RATIO = .57

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DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	3178.	1		1230	151	182.	1		1845	226	0.
1		0005	2	0.	1		0620	77	3133.	1		1235	152	152.	1		1850	227	0.
1		0010	3	0.	1		0625	78	3089.	1		1240	153	125.	1		1855	228	0.
1		0015	4	0.	1		0630	79	3044.	1		1245	154	102.	1		1900	229	0.
1		0020	5	0.	1		0635	80	2999.	1		1250	155	85.	1		1905	230	0.
1		0025	6	0.	1		0640	81	2951.	1		1255	156	71.	1		1910	231	0.
1		0030	7	0.	1		0645	82	2900.	1		1300	157	60.	1		1915	232	0.
1		0035	8	0.	1		0650	83	2848.	1		1305	158	51.	1		1920	233	0.
1		0040	9	0.	1		0655	84	2796.	1		1310	159	44.	1		1925	234	0.
1		0045	10	0.	1		0700	85	2742.	1		1315	160	38.	1		1930	235	0.
1		0050	11	0.	1		0705	86	2688.	1		1320	161	33.	1		1935	236	0.
1		0055	12	0.	1		0710	87	2634.	1		1325	162	29.	1		1940	237	0.
1		0100	13	0.	1		0715	88	2581.	1		1330	163	26.	1		1945	238	0.
1		0105	14	0.	1		0720	89	2529.	1		1335	164	23.	1		1950	239	0.
1		0110	15	0.	1		0725	90	2477.	1		1340	165	21.	1		1955	240	0.
1		0115	16	0.	1		0730	91	2425.	1		1345	166	19.	1		2000	241	0.
1		0120	17	0.	1		0735	92	2373.	1		1350	167	17.	1		2005	242	0.
1		0125	18	0.	1		0740	93	2321.	1		1355	168	16.	1		2010	243	0.
1		0130	19	0.	1		0745	94	2270.	1		1400	169	14.	1		2015	244	0.

1	0135	20	0.	*	1	0750	95	2220.	*	1	1405	170	13.	*	1	2020	245	0.
1	0140	21	0.	*	1	0755	96	2170.	*	1	1410	171	12.	*	1	2025	246	0.
1	0145	22	0.	*	1	0800	97	2122.	*	1	1415	172	11.	*	1	2030	247	0.
1	0150	23	0.	*	1	0805	98	2075.	*	1	1420	173	10.	*	1	2035	248	0.
1	0155	24	0.	*	1	0810	99	2029.	*	1	1425	174	9.	*	1	2040	249	0.
1	0200	25	0.	*	1	0815	100	1983.	*	1	1430	175	8.	*	1	2045	250	0.
1	0205	26	0.	*	1	0820	101	1939.	*	1	1435	176	7.	*	1	2050	251	0.
1	0210	27	0.	*	1	0825	102	1896.	*	1	1440	177	7.	*	1	2055	252	0.
1	0215	28	1.	*	1	0830	103	1854.	*	1	1445	178	6.	*	1	2100	253	0.
1	0220	29	2.	*	1	0835	104	1813.	*	1	1450	179	6.	*	1	2105	254	0.
1	0225	30	3.	*	1	0840	105	1772.	*	1	1455	180	5.	*	1	2110	255	0.
1	0230	31	5.	*	1	0845	106	1733.	*	1	1500	181	5.	*	1	2115	256	0.
1	0235	32	8.	*	1	0850	107	1694.	*	1	1505	182	4.	*	1	2120	257	0.
1	0240	33	12.	*	1	0855	108	1655.	*	1	1510	183	4.	*	1	2125	258	0.
1	0245	34	17.	*	1	0900	109	1615.	*	1	1515	184	4.	*	1	2130	259	0.
1	0250	35	21.	*	1	0905	110	1575.	*	1	1520	185	3.	*	1	2135	260	0.
1	0255	36	27.	*	1	0910	111	1536.	*	1	1525	186	3.	*	1	2140	261	0.
1	0300	37	34.	*	1	0915	112	1497.	*	1	1530	187	3.	*	1	2145	262	0.
1	0305	38	42.	*	1	0920	113	1460.	*	1	1535	188	2.	*	1	2150	263	0.
1	0310	39	54.	*	1	0925	114	1423.	*	1	1540	189	2.	*	1	2155	264	0.
1	0315	40	72.	*	1	0930	115	1387.	*	1	1545	190	2.	*	1	2200	265	0.
1	0320	41	98.	*	1	0935	116	1352.	*	1	1550	191	2.	*	1	2205	266	0.
1	0325	42	138.	*	1	0940	117	1315.	*	1	1555	192	2.	*	1	2210	267	0.
1	0330	43	196.	*	1	0945	118	1277.	*	1	1600	193	2.	*	1	2215	268	0.
1	0335	44	289.	*	1	0950	119	1238.	*	1	1605	194	1.	*	1	2220	269	0.
1	0340	45	436.	*	1	0955	120	1201.	*	1	1610	195	1.	*	1	2225	270	0.
1	0345	46	627.	*	1	1000	121	1165.	*	1	1615	196	1.	*	1	2230	271	0.
1	0350	47	860.	*	1	1005	122	1130.	*	1	1620	197	1.	*	1	2235	272	0.
1	0355	48	1122.	*	1	1010	123	1095.	*	1	1625	198	1.	*	1	2240	273	0.
1	0400	49	1384.	*	1	1015	124	1060.	*	1	1630	199	1.	*	1	2245	274	0.
1	0405	50	1626.	*	1	1020	125	1024.	*	1	1635	200	1.	*	1	2250	275	0.
1	0410	51	1836.	*	1	1025	126	987.	*	1	1640	201	1.	*	1	2255	276	0.
1	0415	52	2021.	*	1	1030	127	949.	*	1	1645	202	1.	*	1	2300	277	0.
1	0420	53	2184.	*	1	1035	128	913.	*	1	1650	203	1.	*	1	2305	278	0.
1	0425	54	2311.	*	1	1040	129	878.	*	1	1655	204	1.	*	1	2310	279	0.
1	0430	55	2406.	*	1	1045	130	844.	*	1	1700	205	0.	*	1	2315	280	0.
1	0435	56	2479.	*	1	1050	131	811.	*	1	1705	206	0.	*	1	2320	281	0.
1	0440	57	2527.	*	1	1055	132	777.	*	1	1710	207	0.	*	1	2325	282	0.
1	0445	58	2552.	*	1	1100	133	742.	*	1	1715	208	0.	*	1	2330	283	0.
1	0450	59	2578.	*	1	1105	134	705.	*	1	1720	209	0.	*	1	2335	284	0.
1	0455	60	2626.	*	1	1110	135	667.	*	1	1725	210	0.	*	1	2340	285	0.
1	0500	61	2708.	*	1	1115	136	632.	*	1	1730	211	0.	*	1	2345	286	0.
1	0505	62	2822.	*	1	1120	137	599.	*	1	1735	212	0.	*	1	2350	287	0.
1	0510	63	2955.	*	1	1125	138	568.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	3096.	*	1	1130	139	537.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	3222.	*	1	1135	140	506.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	3323.	*	1	1140	141	473.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	3400.	*	1	1145	142	436.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	3444.	*	1	1150	143	399.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	3458.	*	1	1155	144	365.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	3450.	*	1	1200	145	334.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	3421.	*	1	1205	146	305.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	3377.	*	1	1210	147	280.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	3328.	*	1	1215	148	257.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	3277.	*	1	1220	149	234.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	3227.	*	1	1225	150	210.	*	1	1840	225	0.	*	2	0055	300	0.

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PEAK FLOW (CFS)	TIME (HR)	MAXIMUM AVERAGE FLOW (CFS) 6-HR	24-HR	72-HR	24.92-HR
+ 3458.	5.67	2372.	681.	656.	656.
	(INCHES)	.248	.285	.285	.285
	(AC-FT)	1176.	1350.	1350.	1350.

CUMULATIVE AREA = 88.86 SQ MI

COMPUTED MUSKINGUM-CUNGE PARAMETERS

ELEMENT	ALPHA	M	COMPUTATION TIME STEP DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	.08	1.64	5.00	750.00	1750.86	345.00	.14	4.94

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

MAIN .08 1.64 5.00 1750.86 345.00 .14

CONTINUITY SUMMARY (AC-FT) - INFLOW= .6538E+03 EXCESS= .0000E+00 OUTFLOW= .6539E+03 BASIN STORAGE= .1003E-01 PERCENT ERROR= .0

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HYDROGRAPH AT STATION FINISH
PLAN 1, RATIO = .44

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DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	1634.	1		1230	151	63.	1		1845	226	0.
1		0005	2	0.	1		0620	77	1620.	1		1235	152	59.	1		1850	227	0.
1		0010	3	0.	1		0625	78	1600.	1		1240	153	56.	1		1855	228	0.
1		0015	4	0.	1		0630	79	1580.	1		1245	154	52.	1		1900	229	0.
1		0020	5	0.	1		0635	80	1555.	1		1250	155	49.	1		1905	230	0.
1		0025	6	0.	1		0640	81	1533.	1		1255	156	46.	1		1910	231	0.
1		0030	7	0.	1		0645	82	1508.	1		1300	157	44.	1		1915	232	0.
1		0035	8	0.	1		0650	83	1484.	1		1305	158	41.	1		1920	233	0.
1		0040	9	0.	1		0655	84	1461.	1		1310	159	39.	1		1925	234	0.
1		0045	10	0.	1		0700	85	1438.	1		1315	160	37.	1		1930	235	0.
1		0050	11	0.	1		0705	86	1418.	1		1320	161	35.	1		1935	236	0.
1		0055	12	0.	1		0710	87	1397.	1		1325	162	33.	1		1940	237	0.
1		0100	13	0.	1		0715	88	1375.	1		1330	163	31.	1		1945	238	0.
1		0105	14	0.	1		0720	89	1352.	1		1335	164	29.	1		1950	239	0.
1		0110	15	0.	1		0725	90	1329.	1		1340	165	27.	1		1955	240	0.
1		0115	16	0.	1		0730	91	1304.	1		1345	166	26.	1		2000	241	0.
1		0120	17	0.	1		0735	92	1279.	1		1350	167	24.	1		2005	242	0.
1		0125	18	0.	1		0740	93	1252.	1		1355	168	23.	1		2010	243	0.
1		0130	19	0.	1		0745	94	1223.	1		1400	169	21.	1		2015	244	0.
1		0135	20	0.	1		0750	95	1194.	1		1405	170	20.	1		2020	245	0.
1		0140	21	0.	1		0755	96	1165.	1		1410	171	19.	1		2025	246	0.
1		0145	22	0.	1		0800	97	1136.	1		1415	172	18.	1		2030	247	0.
1		0150	23	0.	1		0805	98	1108.	1		1420	173	16.	1		2035	248	0.
1		0155	24	0.	1		0810	99	1080.	1		1425	174	15.	1		2040	249	0.
1		0200	25	0.	1		0815	100	1052.	1		1430	175	14.	1		2045	250	0.
1		0205	26	0.	1		0820	101	1025.	1		1435	176	13.	1		2050	251	0.
1		0210	27	0.	1		0825	102	998.	1		1440	177	13.	1		2055	252	0.
1		0215	28	0.	1		0830	103	971.	1		1445	178	12.	1		2100	253	0.
1		0220	29	0.	1		0835	104	945.	1		1450	179	11.	1		2105	254	0.
1		0225	30	0.	1		0840	105	919.	1		1455	180	10.	1		2110	255	0.
1		0230	31	0.	1		0845	106	894.	1		1500	181	10.	1		2115	256	0.
1		0235	32	0.	1		0850	107	868.	1		1505	182	9.	1		2120	257	0.
1		0240	33	0.	1		0855	108	841.	1		1510	183	8.	1		2125	258	0.
1		0245	34	0.	1		0900	109	813.	1		1515	184	8.	1		2130	259	0.
1		0250	35	0.	1		0905	110	783.	1		1520	185	7.	1		2135	260	0.
1		0255	36	0.	1		0910	111	752.	1		1525	186	7.	1		2140	261	0.
1		0300	37	0.	1		0915	112	724.	1		1530	187	7.	1		2145	262	0.
1		0305	38	0.	1		0920	113	697.	1		1535	188	6.	1		2150	263	0.
1		0310	39	1.	1		0925	114	671.	1		1540	189	6.	1		2155	264	0.
1		0315	40	2.	1		0930	115	645.	1		1545	190	5.	1		2200	265	0.
1		0320	41	5.	1		0935	116	621.	1		1550	191	5.	1		2205	266	0.
1		0325	42	11.	1		0940	117	597.	1		1555	192	5.	1		2210	267	0.
1		0330	43	22.	1		0945	118	574.	1		1600	193	4.	1		2215	268	0.
1		0335	44	44.	1		0950	119	551.	1		1605	194	4.	1		2220	269	0.
1		0340	45	82.	1		0955	120	529.	1		1610	195	4.	1		2225	270	0.
1		0345	46	141.	1		1000	121	504.	1		1615	196	4.	1		2230	271	0.
1		0350	47	244.	1		1005	122	475.	1		1620	197	3.	1		2235	272	0.
1		0355	48	368.	1		1010	123	444.	1		1625	198	3.	1		2240	273	0.
1		0400	49	508.	1		1015	124	415.	1		1630	199	3.	1		2245	274	0.
1		0405	50	655.	1		1020	125	390.	1		1635	200	3.	1		2250	275	0.
1		0410	51	779.	1		1025	126	367.	1		1640	201	3.	1		2255	276	0.
1		0415	52	879.	1		1030	127	345.	1		1645	202	3.	1		2300	277	0.
1		0420	53	960.	1		1035	128	325.	1		1650	203	2.	1		2305	278	0.
1		0425	54	1028.	1		1040	129	306.	1		1655	204	2.	1		2310	279	0.
1		0430	55	1086.	1		1045	130	289.	1		1700	205	2.	1		2315	280	0.
1		0435	56	1140.	1		1050	131	272.	1		1705	206	2.	1		2320	281	0.
1		0440	57	1197.	1		1055	132	257.	1		1710	207	2.	1		2325	282	0.
1		0445	58	1248.	1		1100	133	243.	1		1715	208	2.	1		2330	283	0.
1		0450	59	1283.	1		1105	134	230.	1		1720	209	2.	1		2335	284	0.
1		0455	60	1320.	1		1110	135	216.	1		1725	210	2.	1		2340	285	0.
1		0500	61	1381.	1		1115	136	200.	1		1730	211	1.	1		2345	286	0.
1		0505	62	1449.	1		1120	137	180.	1		1735	212	1.	1		2350	287	0.
1		0510	63	1516.	1		1125	138	164.	1		1740	213	1.	1		2355	288	0.
1		0515	64	1580.	1		1130	139	150.	1		1745	214	1.	2		0000	289	0.
1		0520	65	1633.	1		1135	140	138.	1		1750	215	1.	2		0005	290	0.

1	0525	66	1671.	*	1	1140	141	126.	*	1	1755	216	1.	*	2	0010	291	0.
1	0530	67	1693.	*	1	1145	142	116.	*	1	1800	217	1.	*	2	0015	292	0.
1	0535	68	1711.	*	1	1150	143	107.	*	1	1805	218	1.	*	2	0020	293	0.
1	0540	69	1734.	*	1	1155	144	100.	*	1	1810	219	1.	*	2	0025	294	0.
1	0545	70	1751.	*	1	1200	145	93.	*	1	1815	220	1.	*	2	0030	295	0.
1	0550	71	1738.	*	1	1205	146	87.	*	1	1820	221	1.	*	2	0035	296	0.
1	0555	72	1706.	*	1	1210	147	81.	*	1	1825	222	1.	*	2	0040	297	0.
1	0600	73	1685.	*	1	1215	148	76.	*	1	1830	223	1.	*	2	0045	298	0.
1	0605	74	1669.	*	1	1220	149	71.	*	1	1835	224	1.	*	2	0050	299	0.
1	0610	75	1648.	*	1	1225	150	67.	*	1	1840	225	1.	*	2	0055	300	0.
				*					*					*				

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 1751.	5.75		1196.	330.	318.	318.
		(INCHES)	.125	.138	.138	.138
		(AC-FT)	593.	654.	654.	654.

CUMULATIVE AREA = 88.86 SQ MI

COMPUTED MUSKINGUM-CUNGE PARAMETERS
COMPUTATION TIME STEP

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	.08	1.64	5.00	375.00	284.95	355.00	.02	2.44

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

MAIN	.08	1.64	5.00	284.95	355.00	.02	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .8591E+02 EXCESS= .0000E+00 OUTFLOW= .8593E+02 BASIN STORAGE= .4489E-01 PERCENT ERROR= -.1

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HYDROGRAPH AT STATION FINISH
PLAN 1, RATIO = .26

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DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	*	1		0615	76	252.	*	1		1230	151	27.	*	1		1845	226	2.
1		0005	2	0.	*	1		0620	77	248.	*	1		1235	152	26.	*	1		1850	227	2.
1		0010	3	0.	*	1		0625	78	242.	*	1		1240	153	25.	*	1		1855	228	2.
1		0015	4	0.	*	1		0630	79	239.	*	1		1245	154	24.	*	1		1900	229	2.
1		0020	5	0.	*	1		0635	80	236.	*	1		1250	155	24.	*	1		1905	230	2.
1		0025	6	0.	*	1		0640	81	228.	*	1		1255	156	23.	*	1		1910	231	2.
1		0030	7	0.	*	1		0645	82	221.	*	1		1300	157	22.	*	1		1915	232	2.
1		0035	8	0.	*	1		0650	83	210.	*	1		1305	158	21.	*	1		1920	233	2.
1		0040	9	0.	*	1		0655	84	201.	*	1		1310	159	21.	*	1		1925	234	2.
1		0045	10	0.	*	1		0700	85	189.	*	1		1315	160	20.	*	1		1930	235	2.
1		0050	11	0.	*	1		0705	86	179.	*	1		1320	161	20.	*	1		1935	236	2.
1		0055	12	0.	*	1		0710	87	168.	*	1		1325	162	19.	*	1		1940	237	1.
1		0100	13	0.	*	1		0715	88	158.	*	1		1330	163	18.	*	1		1945	238	1.
1		0105	14	0.	*	1		0720	89	148.	*	1		1335	164	18.	*	1		1950	239	1.
1		0110	15	0.	*	1		0725	90	139.	*	1		1340	165	17.	*	1		1955	240	1.
1		0115	16	0.	*	1		0730	91	130.	*	1		1345	166	17.	*	1		2000	241	1.
1		0120	17	0.	*	1		0735	92	122.	*	1		1350	167	16.	*	1		2005	242	1.
1		0125	18	0.	*	1		0740	93	115.	*	1		1355	168	16.	*	1		2010	243	1.
1		0130	19	0.	*	1		0745	94	108.	*	1		1400	169	16.	*	1		2015	244	1.
1		0135	20	0.	*	1		0750	95	102.	*	1		1405	170	15.	*	1		2020	245	1.
1		0140	21	0.	*	1		0755	96	97.	*	1		1410	171	15.	*	1		2025	246	1.
1		0145	22	0.	*	1		0800	97	95.	*	1		1415	172	14.	*	1		2030	247	1.
1		0150	23	0.	*	1		0805	98	99.	*	1		1420	173	14.	*	1		2035	248	1.
1		0155	24	0.	*	1		0810	99	113.	*	1		1425	174	14.	*	1		2040	249	1.
1		0200	25	0.	*	1		0815	100	128.	*	1		1430	175	13.	*	1		2045	250	1.
1		0205	26	0.	*	1		0820	101	129.	*	1		1435	176	13.	*	1		2050	251	1.
1		0210	27	0.	*	1		0825	102	119.	*	1		1440	177	12.	*	1		2055	252	1.
1		0215	28	0.	*	1		0830	103	112.	*	1		1445	178	12.	*	1		2100	253	1.
1		0220	29	0.	*	1		0835	104	111.	*	1		1450	179	12.	*	1		2105	254	1.
1		0225	30	0.	*	1		0840	105	107.	*	1		1455	180	11.	*	1		2110	255	1.

1	0230	31	0.	*	1	0845	106	100.	*	1	1500	181	11.	*	1	2115	256	1.
1	0235	32	0.	*	1	0850	107	96.	*	1	1505	182	11.	*	1	2120	257	1.
1	0240	33	0.	*	1	0855	108	93.	*	1	1510	183	10.	*	1	2125	258	1.
1	0245	34	0.	*	1	0900	109	89.	*	1	1515	184	10.	*	1	2130	259	1.
1	0250	35	0.	*	1	0905	110	88.	*	1	1520	185	10.	*	1	2135	260	1.
1	0255	36	0.	*	1	0910	111	90.	*	1	1525	186	10.	*	1	2140	261	1.
1	0300	37	0.	*	1	0915	112	92.	*	1	1530	187	9.	*	1	2145	262	1.
1	0305	38	0.	*	1	0920	113	95.	*	1	1535	188	9.	*	1	2150	263	1.
1	0310	39	0.	*	1	0925	114	94.	*	1	1540	189	9.	*	1	2155	264	0.
1	0315	40	0.	*	1	0930	115	89.	*	1	1545	190	9.	*	1	2200	265	0.
1	0320	41	0.	*	1	0935	116	86.	*	1	1550	191	8.	*	1	2205	266	0.
1	0325	42	0.	*	1	0940	117	84.	*	1	1555	192	8.	*	1	2210	267	0.
1	0330	43	0.	*	1	0945	118	82.	*	1	1600	193	8.	*	1	2215	268	0.
1	0335	44	0.	*	1	0950	119	81.	*	1	1605	194	7.	*	1	2220	269	0.
1	0340	45	0.	*	1	0955	120	76.	*	1	1610	195	7.	*	1	2225	270	0.
1	0345	46	0.	*	1	1000	121	72.	*	1	1615	196	7.	*	1	2230	271	0.
1	0350	47	0.	*	1	1005	122	71.	*	1	1620	197	7.	*	1	2235	272	0.
1	0355	48	1.	*	1	1010	123	69.	*	1	1625	198	6.	*	1	2240	273	0.
1	0400	49	3.	*	1	1015	124	67.	*	1	1630	199	6.	*	1	2245	274	0.
1	0405	50	7.	*	1	1020	125	64.	*	1	1635	200	6.	*	1	2250	275	0.
1	0410	51	12.	*	1	1025	126	61.	*	1	1640	201	6.	*	1	2255	276	0.
1	0415	52	19.	*	1	1030	127	59.	*	1	1645	202	6.	*	1	2300	277	0.
1	0420	53	31.	*	1	1035	128	58.	*	1	1650	203	5.	*	1	2305	278	0.
1	0425	54	45.	*	1	1040	129	57.	*	1	1655	204	5.	*	1	2310	279	0.
1	0430	55	61.	*	1	1045	130	56.	*	1	1700	205	5.	*	1	2315	280	0.
1	0435	56	79.	*	1	1050	131	54.	*	1	1705	206	5.	*	1	2320	281	0.
1	0440	57	95.	*	1	1055	132	52.	*	1	1710	207	5.	*	1	2325	282	0.
1	0445	58	103.	*	1	1100	133	51.	*	1	1715	208	4.	*	1	2330	283	0.
1	0450	59	112.	*	1	1105	134	50.	*	1	1720	209	4.	*	1	2335	284	0.
1	0455	60	119.	*	1	1110	135	47.	*	1	1725	210	4.	*	1	2340	285	0.
1	0500	61	126.	*	1	1115	136	45.	*	1	1730	211	4.	*	1	2345	286	0.
1	0505	62	136.	*	1	1120	137	44.	*	1	1735	212	4.	*	1	2350	287	0.
1	0510	63	149.	*	1	1125	138	43.	*	1	1740	213	4.	*	1	2355	288	0.
1	0515	64	165.	*	1	1130	139	41.	*	1	1745	214	3.	*	2	0000	289	0.
1	0520	65	184.	*	1	1135	140	40.	*	1	1750	215	3.	*	2	0005	290	0.
1	0525	66	210.	*	1	1140	141	38.	*	1	1755	216	3.	*	2	0010	291	0.
1	0530	67	244.	*	1	1145	142	37.	*	1	1800	217	3.	*	2	0015	292	0.
1	0535	68	274.	*	1	1150	143	36.	*	1	1805	218	3.	*	2	0020	293	0.
1	0540	69	281.	*	1	1155	144	35.	*	1	1810	219	3.	*	2	0025	294	0.
1	0545	70	278.	*	1	1200	145	33.	*	1	1815	220	3.	*	2	0030	295	0.
1	0550	71	284.	*	1	1205	146	32.	*	1	1820	221	3.	*	2	0035	296	0.
1	0555	72	285.	*	1	1210	147	31.	*	1	1825	222	3.	*	2	0040	297	0.
1	0600	73	273.	*	1	1215	148	30.	*	1	1830	223	2.	*	2	0045	298	0.
1	0605	74	268.	*	1	1220	149	29.	*	1	1835	224	2.	*	2	0050	299	0.
1	0610	75	261.	*	1	1225	150	28.	*	1	1840	225	2.	*	2	0055	300	0.
				*					*					*				

****

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 285.	5.92		145.	43.	42.	42.
		(INCHES)	.015	.018	.018	.018
		(AC-FT)	72.	86.	86.	86.

CUMULATIVE AREA = 88.86 SQ MI

```
1****************************************                                                    ****************************************
 *                                      *                                                    *                                      *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *                                                    *    U.S. ARMY CORPS OF ENGINEERS      *
 *               JUN   1998             *                                                    *    HYDROLOGIC ENGINEERING CENTER     *
 *            VERSION 4.1               *                                                    *          609 SECOND STREET           *
 *                                      *                                                    *       DAVIS, CALIFORNIA 95616        *
 *  RUN DATE   18MAR08  TIME  14:38:08  *                                                    *           (916) 756-1104             *
 *                                      *                                                    *                                      *
 ****************************************                                                    ****************************************


                                                X     X  XXXXXXX   XXXXX           X
                                                X     X  X        X     X         XX
                                                X     X  X        X                X
                                                XXXXXXX  XXXX     X        XXXXX   X
                                                X     X  X        X                X
                                                X     X  X        X     X          X
                                                X     X  XXXXXXX   XXXXX          XXX


          THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

          THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
          THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
          NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
          DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL   LOSS RATE:GREEN AND AMPT INFILTRATION
          KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

1                                                   HEC-1 INPUT                                                PAGE  1

          LINE           ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 *** FREE ***
 *** NOLIST ***
1****************************************                                                    ****************************************
 *                                      *                                                    *                                      *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *                                                    *    U.S. ARMY CORPS OF ENGINEERS      *
 *               JUN   1998             *                                                    *    HYDROLOGIC ENGINEERING CENTER     *
 *            VERSION 4.1               *                                                    *          609 SECOND STREET           *
 *                                      *                                                    *       DAVIS, CALIFORNIA 95616        *
 *  RUN DATE   18MAR08  TIME  14:38:08  *                                                    *           (916) 756-1104             *
 *                                      *                                                    *                                      *
 ****************************************                                                    ****************************************


                              KLEINFELDER
                              FEBRUARY 2008
                              ALTERNATIVE A

                              DESIGN STORM = 100-YEAR 6-HOUR STORM
                              STORM DISTRIBUTION = SDN5


   10 IO          OUTPUT CONTROL VARIABLES
                        IPRNT           5  PRINT CONTROL
                        IPLOT           0  PLOT CONTROL
                        QSCAL          0.  HYDROGRAPH PLOT SCALE

      IT          HYDROGRAPH TIME DATA
                         NMIN           5  MINUTES IN COMPUTATION INTERVAL
                        IDATE      1    0  STARTING DATE
                        ITIME        0000  STARTING TIME
                           NQ         300  NUMBER OF HYDROGRAPH ORDINATES
                       NDDATE      2    0  ENDING DATE
                       NDTIME        0055  ENDING TIME
                       ICENT          19  CENTURY MARK

                    COMPUTATION INTERVAL     .08 HOURS
                         TOTAL TIME BASE   24.92 HOURS

          ENGLISH UNITS
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              DRAINAGE AREA         SQUARE MILES
              PRECIPITATION DEPTH   INCHES
              LENGTH, ELEVATION     FEET
              FLOW                  CUBIC FEET PER SECOND
              STORAGE VOLUME        ACRE-FEET
              SURFACE AREA          ACRES
              TEMPERATURE           DEGREES FAHRENHEIT

     JP          MULTI-PLAN OPTION
                       NPLAN           1  NUMBER OF PLANS

     JR          MULTI-RATIO OPTION
                     RATIOS OF PRECIPITATION
                   1.00       .87       .74       .57       .44       .26


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


            **************
            *            *
1250 KK     *     ULWIN  *
            *            *
            **************

1254 KO          OUTPUT CONTROL VARIABLES
                       IPRNT           1  PRINT CONTROL
                       IPLOT           0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE

1253 HC          HYDROGRAPH COMBINATION
                       ICOMP           4  NUMBER OF HYDROGRAPHS TO COMBINE

                                                                  ***
*****************************************************************************************************************************************

                                                   HYDROGRAPH AT STATION    ULWIN
                                                        SUM OF  4 HYDROGRAPHS
                                                       PLAN 1,   RATIO =  1.00
*****************************************************************************************************************************************
                                 *                                 *                                 *
   DA MON HRMN  ORD      FLOW    *   DA MON HRMN  ORD      FLOW   *   DA MON HRMN  ORD      FLOW    *   DA MON HRMN  ORD      FLOW
                                 *                                 *                                 *
    1     0000    1        0.    *    1     0615   76     8105.   *    1     1230  151        5.    *    1     1845  226        0.
    1     0005    2        0.    *    1     0620   77     7451.   *    1     1235  152        4.    *    1     1850  227        0.
    1     0010    3        0.    *    1     0625   78     6842.   *    1     1240  153        4.    *    1     1855  228        0.
    1     0015    4        0.    *    1     0630   79     6278.   *    1     1245  154        3.    *    1     1900  229        0.
    1     0020    5        0.    *    1     0635   80     5765.   *    1     1250  155        3.    *    1     1905  230        0.
    1     0025    6        0.    *    1     0640   81     5302.   *    1     1255  156        2.    *    1     1910  231        0.
    1     0030    7        0.    *    1     0645   82     4882.   *    1     1300  157        2.    *    1     1915  232        0.
    1     0035    8        0.    *    1     0650   83     4494.   *    1     1305  158        2.    *    1     1920  233        0.
    1     0040    9        0.    *    1     0655   84     4136.   *    1     1310  159        2.    *    1     1925  234        0.
    1     0045   10        0.    *    1     0700   85     3807.   *    1     1315  160        1.    *    1     1930  235        0.
    1     0050   11        1.    *    1     0705   86     3504.   *    1     1320  161        1.    *    1     1935  236        0.
    1     0055   12        2.    *    1     0710   87     3223.   *    1     1325  162        1.    *    1     1940  237        0.
    1     0100   13        4.    *    1     0715   88     2962.   *    1     1330  163        1.    *    1     1945  238        0.
    1     0105   14        6.    *    1     0720   89     2719.   *    1     1335  164        1.    *    1     1950  239        0.
    1     0110   15        9.    *    1     0725   90     2494.   *    1     1340  165        1.    *    1     1955  240        0.
    1     0115   16       12.    *    1     0730   91     2289.   *    1     1345  166        1.    *    1     2000  241        0.
    1     0120   17       16.    *    1     0735   92     2101.   *    1     1350  167        0.    *    1     2005  242        0.
    1     0125   18       20.    *    1     0740   93     1929.   *    1     1355  168        0.    *    1     2010  243        0.
    1     0130   19       25.    *    1     0745   94     1769.   *    1     1400  169        0.    *    1     2015  244        0.
    1     0135   20       31.    *    1     0750   95     1623.   *    1     1405  170        0.    *    1     2020  245        0.
    1     0140   21       38.    *    1     0755   96     1490.   *    1     1410  171        0.    *    1     2025  246        0.
    1     0145   22       47.    *    1     0800   97     1370.   *    1     1415  172        0.    *    1     2030  247        0.
    1     0150   23       56.    *    1     0805   98     1261.   *    1     1420  173        0.    *    1     2035  248        0.
    1     0155   24       68.    *    1     0810   99     1161.   *    1     1425  174        0.    *    1     2040  249        0.
    1     0200   25       81.    *    1     0815  100     1069.   *    1     1430  175        0.    *    1     2045  250        0.
    1     0205   26       96.    *    1     0820  101      983.   *    1     1435  176        0.    *    1     2050  251        0.
    1     0210   27      115.    *    1     0825  102      901.   *    1     1440  177        0.    *    1     2055  252        0.
    1     0215   28      138.    *    1     0830  103      825.   *    1     1445  178        0.    *    1     2100  253        0.
    1     0220   29      163.    *    1     0835  104      754.   *    1     1450  179        0.    *    1     2105  254        0.
    1     0225   30      192.    *    1     0840  105      688.   *    1     1455  180        0.    *    1     2110  255        0.
    1     0230   31      222.    *    1     0845  106      626.   *    1     1500  181        0.    *    1     2115  256        0.
    1     0235   32      254.    *    1     0850  107      569.   *    1     1505  182        0.    *    1     2120  257        0.
    1     0240   33      287.    *    1     0855  108      516.   *    1     1510  183        0.    *    1     2125  258        0.
    1     0245   34      321.    *    1     0900  109      468.   *    1     1515  184        0.    *    1     2130  259        0.
    1     0250   35      354.    *    1     0905  110      425.   *    1     1520  185        0.    *    1     2135  260        0.
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1	0255	36	388.	*	1	0910	111	386.	*	1	1525	186	0.	*	1	2140	261	0.
1	0300	37	428.	*	1	0915	112	352.	*	1	1530	187	0.	*	1	2145	262	0.
1	0305	38	476.	*	1	0920	113	320.	*	1	1535	188	0.	*	1	2150	263	0.
1	0310	39	539.	*	1	0925	114	292.	*	1	1540	189	0.	*	1	2155	264	0.
1	0315	40	623.	*	1	0930	115	266.	*	1	1545	190	0.	*	1	2200	265	0.
1	0320	41	739.	*	1	0935	116	242.	*	1	1550	191	0.	*	1	2205	266	0.
1	0325	42	900.	*	1	0940	117	220.	*	1	1555	192	0.	*	1	2210	267	0.
1	0330	43	1127.	*	1	0945	118	200.	*	1	1600	193	0.	*	1	2215	268	0.
1	0335	44	1443.	*	1	0950	119	181.	*	1	1605	194	0.	*	1	2220	269	0.
1	0340	45	1861.	*	1	0955	120	164.	*	1	1610	195	0.	*	1	2225	270	0.
1	0345	46	2360.	*	1	1000	121	148.	*	1	1615	196	0.	*	1	2230	271	0.
1	0350	47	2899.	*	1	1005	122	134.	*	1	1620	197	0.	*	1	2235	272	0.
1	0355	48	3425.	*	1	1010	123	120.	*	1	1625	198	0.	*	1	2240	273	0.
1	0400	49	3902.	*	1	1015	124	109.	*	1	1630	199	0.	*	1	2245	274	0.
1	0405	50	4430.	*	1	1020	125	98.	*	1	1635	200	0.	*	1	2250	275	0.
1	0410	51	5376.	*	1	1025	126	88.	*	1	1640	201	0.	*	1	2255	276	0.
1	0415	52	7000.	*	1	1030	127	79.	*	1	1645	202	0.	*	1	2300	277	0.
1	0420	53	9168.	*	1	1035	128	71.	*	1	1650	203	0.	*	1	2305	278	0.
1	0425	54	11274.	*	1	1040	129	64.	*	1	1655	204	0.	*	1	2310	279	0.
1	0430	55	12794.	*	1	1045	130	57.	*	1	1700	205	0.	*	1	2315	280	0.
1	0435	56	13579.	*	1	1050	131	51.	*	1	1705	206	0.	*	1	2320	281	0.
1	0440	57	13785.	*	1	1055	132	46.	*	1	1710	207	0.	*	1	2325	282	0.
1	0445	58	13632.	*	1	1100	133	41.	*	1	1715	208	0.	*	1	2330	283	0.
1	0450	59	13291.	*	1	1105	134	37.	*	1	1720	209	0.	*	1	2335	284	0.
1	0455	60	12864.	*	1	1110	135	33.	*	1	1725	210	0.	*	1	2340	285	0.
1	0500	61	12466.	*	1	1115	136	29.	*	1	1730	211	0.	*	1	2345	286	0.
1	0505	62	12153.	*	1	1120	137	26.	*	1	1735	212	0.	*	1	2350	287	0.
1	0510	63	11916.	*	1	1125	138	23.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	11741.	*	1	1130	139	21.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	11624.	*	1	1135	140	18.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	11564.	*	1	1140	141	17.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	11547.	*	1	1145	142	15.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	11541.	*	1	1150	143	13.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	11500.	*	1	1155	144	12.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	11377.	*	1	1200	145	10.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	11108.	*	1	1205	146	9.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	10678.	*	1	1210	147	8.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	10124.	*	1	1215	148	7.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	9484.	*	1	1220	149	6.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	8795.	*	1	1225	150	6.	*	1	1840	225	0.	*	2	0055	300	0.

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 13785.	4.67		5548.	1414.	1362.	1362.
		(INCHES)	.877	.894	.894	.894
		(AC-FT)	2751.	2805.	2805.	2805.

CUMULATIVE AREA = 58.84 SQ MI

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HYDROGRAPH AT STATION ULWIN
SUM OF 4 HYDROGRAPHS
PLAN 1, RATIO = .87

****

DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	*	1		0615	76	6696.	*	1		1230	151	7.	*	1		1845	226	0.
1		0005	2	0.	*	1		0620	77	6193.	*	1		1235	152	6.	*	1		1850	227	0.
1		0010	3	0.	*	1		0625	78	5711.	*	1		1240	153	6.	*	1		1855	228	0.
1		0015	4	0.	*	1		0630	79	5261.	*	1		1245	154	5.	*	1		1900	229	0.
1		0020	5	0.	*	1		0635	80	4845.	*	1		1250	155	4.	*	1		1905	230	0.
1		0025	6	0.	*	1		0640	81	4464.	*	1		1255	156	4.	*	1		1910	231	0.
1		0030	7	0.	*	1		0645	82	4116.	*	1		1300	157	3.	*	1		1915	232	0.
1		0035	8	0.	*	1		0650	83	3797.	*	1		1305	158	3.	*	1		1920	233	0.
1		0040	9	0.	*	1		0655	84	3506.	*	1		1310	159	3.	*	1		1925	234	0.
1		0045	10	0.	*	1		0700	85	3237.	*	1		1315	160	2.	*	1		1930	235	0.
1		0050	11	0.	*	1		0705	86	2990.	*	1		1320	161	2.	*	1		1935	236	0.
1		0055	12	0.	*	1		0710	87	2761.	*	1		1325	162	2.	*	1		1940	237	0.
1		0100	13	0.	*	1		0715	88	2548.	*	1		1330	163	2.	*	1		1945	238	0.
1		0105	14	1.	*	1		0720	89	2350.	*	1		1335	164	1.	*	1		1950	239	0.
1		0110	15	1.	*	1		0725	90	2167.	*	1		1340	165	1.	*	1		1955	240	0.
1		0115	16	2.	*	1		0730	91	1997.	*	1		1345	166	1.	*	1		2000	241	0.
1		0120	17	3.	*	1		0735	92	1840.	*	1		1350	167	1.	*	1		2005	242	0.

1	0125	18	4.	*	1	0740	93	1696.	*	1	1355	168	1.	*	1	2010	243	0.
1	0130	19	6.	*	1	0745	94	1563.	*	1	1400	169	1.	*	1	2015	244	0.
1	0135	20	8.	*	1	0750	95	1442.	*	1	1405	170	1.	*	1	2020	245	0.
1	0140	21	11.	*	1	0755	96	1330.	*	1	1410	171	1.	*	1	2025	246	0.
1	0145	22	15.	*	1	0800	97	1228.	*	1	1415	172	0.	*	1	2030	247	0.
1	0150	23	19.	*	1	0805	98	1135.	*	1	1420	173	0.	*	1	2035	248	0.
1	0155	24	25.	*	1	0810	99	1050.	*	1	1425	174	0.	*	1	2040	249	0.
1	0200	25	33.	*	1	0815	100	968.	*	1	1430	175	0.	*	1	2045	250	0.
1	0205	26	42.	*	1	0820	101	890.	*	1	1435	176	0.	*	1	2050	251	0.
1	0210	27	54.	*	1	0825	102	818.	*	1	1440	177	0.	*	1	2055	252	0.
1	0215	28	68.	*	1	0830	103	753.	*	1	1445	178	0.	*	1	2100	253	0.
1	0220	29	82.	*	1	0835	104	694.	*	1	1450	179	0.	*	1	2105	254	0.
1	0225	30	98.	*	1	0840	105	639.	*	1	1455	180	0.	*	1	2110	255	0.
1	0230	31	114.	*	1	0845	106	588.	*	1	1500	181	0.	*	1	2115	256	0.
1	0235	32	130.	*	1	0850	107	540.	*	1	1505	182	0.	*	1	2120	257	0.
1	0240	33	146.	*	1	0855	108	495.	*	1	1510	183	0.	*	1	2125	258	0.
1	0245	34	163.	*	1	0900	109	452.	*	1	1515	184	0.	*	1	2130	259	0.
1	0250	35	180.	*	1	0905	110	412.	*	1	1520	185	0.	*	1	2135	260	0.
1	0255	36	197.	*	1	0910	111	375.	*	1	1525	186	0.	*	1	2140	261	0.
1	0300	37	214.	*	1	0915	112	342.	*	1	1530	187	0.	*	1	2145	262	0.
1	0305	38	235.	*	1	0920	113	312.	*	1	1535	188	0.	*	1	2150	263	0.
1	0310	39	264.	*	1	0925	114	285.	*	1	1540	189	0.	*	1	2155	264	0.
1	0315	40	309.	*	1	0930	115	260.	*	1	1545	190	0.	*	1	2200	265	0.
1	0320	41	376.	*	1	0935	116	238.	*	1	1550	191	0.	*	1	2205	266	0.
1	0325	42	477.	*	1	0940	117	218.	*	1	1555	192	0.	*	1	2210	267	0.
1	0330	43	623.	*	1	0945	118	199.	*	1	1600	193	0.	*	1	2215	268	0.
1	0335	44	836.	*	1	0950	119	183.	*	1	1605	194	0.	*	1	2220	269	0.
1	0340	45	1134.	*	1	0955	120	167.	*	1	1610	195	0.	*	1	2225	270	0.
1	0345	46	1505.	*	1	1000	121	153.	*	1	1615	196	0.	*	1	2230	271	0.
1	0350	47	1917.	*	1	1005	122	140.	*	1	1620	197	0.	*	1	2235	272	0.
1	0355	48	2333.	*	1	1010	123	128.	*	1	1625	198	0.	*	1	2240	273	0.
1	0400	49	2702.	*	1	1015	124	117.	*	1	1630	199	0.	*	1	2245	274	0.
1	0405	50	3007.	*	1	1020	125	107.	*	1	1635	200	0.	*	1	2250	275	0.
1	0410	51	3272.	*	1	1025	126	98.	*	1	1640	201	0.	*	1	2255	276	0.
1	0415	52	3652.	*	1	1030	127	90.	*	1	1645	202	0.	*	1	2300	277	0.
1	0420	53	4678.	*	1	1035	128	82.	*	1	1650	203	0.	*	1	2305	278	0.
1	0425	54	6077.	*	1	1040	129	75.	*	1	1655	204	0.	*	1	2310	279	0.
1	0430	55	7455.	*	1	1045	130	68.	*	1	1700	205	0.	*	1	2315	280	0.
1	0435	56	8585.	*	1	1050	131	62.	*	1	1705	206	0.	*	1	2320	281	0.
1	0440	57	9320.	*	1	1055	132	56.	*	1	1710	207	0.	*	1	2325	282	0.
1	0445	58	9657.	*	1	1100	133	51.	*	1	1715	208	0.	*	1	2330	283	0.
1	0450	59	9730.	*	1	1105	134	46.	*	1	1720	209	0.	*	1	2335	284	0.
1	0455	60	9644.	*	1	1110	135	41.	*	1	1725	210	0.	*	1	2340	285	0.
1	0500	61	9468.	*	1	1115	136	37.	*	1	1730	211	0.	*	1	2345	286	0.
1	0505	62	9274.	*	1	1120	137	34.	*	1	1735	212	0.	*	1	2350	287	0.
1	0510	63	9118.	*	1	1125	138	30.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	9014.	*	1	1130	139	27.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	8949.	*	1	1135	140	24.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	8906.	*	1	1140	141	22.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	8885.	*	1	1145	142	19.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	8882.	*	1	1150	143	17.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	8865.	*	1	1155	144	16.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	8809.	*	1	1200	145	14.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	8673.	*	1	1205	146	12.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	8438.	*	1	1210	147	11.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	8104.	*	1	1215	148	10.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	7683.	*	1	1220	149	9.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	7203.	*	1	1225	150	8.	*	1	1840	225	0.	*	2	0055	300	0.

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PEAK FLOW (CFS)	TIME (HR)	MAXIMUM AVERAGE FLOW (CFS)	6-HR	24-HR	72-HR	24.92-HR
+ 9730.	4.83		4154.	1059.	1020.	1020.
		(INCHES)	.656	.670	.670	.670
		(AC-FT)	2060.	2101.	2101.	2101.

CUMULATIVE AREA = 58.84 SQ MI

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HYDROGRAPH AT STATION ULWIN
SUM OF 4 HYDROGRAPHS
PLAN 1, RATIO = .74

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DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW

1	0000	1	0.	*	1	0615	76	5221.	*	1	1230	151	11.	*	1	1845	226	0.
1	0005	2	0.	*	1	0620	77	4877.	*	1	1235	152	10.	*	1	1850	227	0.
1	0010	3	0.	*	1	0625	78	4533.	*	1	1240	153	9.	*	1	1855	228	0.
1	0015	4	0.	*	1	0630	79	4200.	*	1	1245	154	8.	*	1	1900	229	0.
1	0020	5	0.	*	1	0635	80	3886.	*	1	1250	155	7.	*	1	1905	230	0.
1	0025	6	0.	*	1	0640	81	3595.	*	1	1255	156	6.	*	1	1910	231	0.
1	0030	7	0.	*	1	0645	82	3326.	*	1	1300	157	6.	*	1	1915	232	0.
1	0035	8	0.	*	1	0650	83	3078.	*	1	1305	158	5.	*	1	1920	233	0.
1	0040	9	0.	*	1	0655	84	2851.	*	1	1310	159	5.	*	1	1925	234	0.
1	0045	10	0.	*	1	0700	85	2640.	*	1	1315	160	4.	*	1	1930	235	0.
1	0050	11	0.	*	1	0705	86	2446.	*	1	1320	161	4.	*	1	1935	236	0.
1	0055	12	0.	*	1	0710	87	2267.	*	1	1325	162	3.	*	1	1940	237	0.
1	0100	13	0.	*	1	0715	88	2102.	*	1	1330	163	3.	*	1	1945	238	0.
1	0105	14	0.	*	1	0720	89	1949.	*	1	1335	164	3.	*	1	1950	239	0.
1	0110	15	0.	*	1	0725	90	1806.	*	1	1340	165	2.	*	1	1955	240	0.
1	0115	16	0.	*	1	0730	91	1673.	*	1	1345	166	2.	*	1	2000	241	0.
1	0120	17	0.	*	1	0735	92	1550.	*	1	1350	167	2.	*	1	2005	242	0.
1	0125	18	0.	*	1	0740	93	1436.	*	1	1355	168	2.	*	1	2010	243	0.
1	0130	19	0.	*	1	0745	94	1330.	*	1	1400	169	1.	*	1	2015	244	0.
1	0135	20	1.	*	1	0750	95	1232.	*	1	1405	170	1.	*	1	2020	245	0.
1	0140	21	1.	*	1	0755	96	1141.	*	1	1410	171	1.	*	1	2025	246	0.
1	0145	22	2.	*	1	0800	97	1058.	*	1	1415	172	1.	*	1	2030	247	0.
1	0150	23	4.	*	1	0805	98	981.	*	1	1420	173	1.	*	1	2035	248	0.
1	0155	24	6.	*	1	0810	99	910.	*	1	1425	174	1.	*	1	2040	249	0.
1	0200	25	9.	*	1	0815	100	844.	*	1	1430	175	1.	*	1	2045	250	0.
1	0205	26	12.	*	1	0820	101	784.	*	1	1435	176	1.	*	1	2050	251	0.
1	0210	27	17.	*	1	0825	102	728.	*	1	1440	177	0.	*	1	2055	252	0.
1	0215	28	22.	*	1	0830	103	677.	*	1	1445	178	0.	*	1	2100	253	0.
1	0220	29	30.	*	1	0835	104	630.	*	1	1450	179	0.	*	1	2105	254	0.
1	0225	30	38.	*	1	0840	105	587.	*	1	1455	180	0.	*	1	2110	255	0.
1	0230	31	47.	*	1	0845	106	547.	*	1	1500	181	0.	*	1	2115	256	0.
1	0235	32	57.	*	1	0850	107	509.	*	1	1505	182	0.	*	1	2120	257	0.
1	0240	33	66.	*	1	0855	108	474.	*	1	1510	183	0.	*	1	2125	258	0.
1	0245	34	75.	*	1	0900	109	441.	*	1	1515	184	0.	*	1	2130	259	0.
1	0250	35	83.	*	1	0905	110	410.	*	1	1520	185	0.	*	1	2135	260	0.
1	0255	36	92.	*	1	0910	111	382.	*	1	1525	186	0.	*	1	2140	261	0.
1	0300	37	100.	*	1	0915	112	355.	*	1	1530	187	0.	*	1	2145	262	0.
1	0305	38	110.	*	1	0920	113	328.	*	1	1535	188	0.	*	1	2150	263	0.
1	0310	39	122.	*	1	0925	114	301.	*	1	1540	189	0.	*	1	2155	264	0.
1	0315	40	140.	*	1	0930	115	276.	*	1	1545	190	0.	*	1	2200	265	0.
1	0320	41	166.	*	1	0935	116	254.	*	1	1550	191	0.	*	1	2205	266	0.
1	0325	42	209.	*	1	0940	117	234.	*	1	1555	192	0.	*	1	2210	267	0.
1	0330	43	275.	*	1	0945	118	215.	*	1	1600	193	0.	*	1	2215	268	0.
1	0335	44	377.	*	1	0950	119	198.	*	1	1605	194	0.	*	1	2220	269	0.
1	0340	45	536.	*	1	0955	120	182.	*	1	1610	195	0.	*	1	2225	270	0.
1	0345	46	767.	*	1	1000	121	168.	*	1	1615	196	0.	*	1	2230	271	0.
1	0350	47	1052.	*	1	1005	122	155.	*	1	1620	197	0.	*	1	2235	272	0.
1	0355	48	1362.	*	1	1010	123	143.	*	1	1625	198	0.	*	1	2240	273	0.
1	0400	49	1652.	*	1	1015	124	132.	*	1	1630	199	0.	*	1	2245	274	0.
1	0405	50	1876.	*	1	1020	125	121.	*	1	1635	200	0.	*	1	2250	275	0.
1	0410	51	2023.	*	1	1025	126	112.	*	1	1640	201	0.	*	1	2255	276	0.
1	0415	52	2106.	*	1	1030	127	103.	*	1	1645	202	0.	*	1	2300	277	0.
1	0420	53	2149.	*	1	1035	128	95.	*	1	1650	203	0.	*	1	2305	278	0.
1	0425	54	2426.	*	1	1040	129	87.	*	1	1655	204	0.	*	1	2310	279	0.
1	0430	55	3347.	*	1	1045	130	80.	*	1	1700	205	0.	*	1	2315	280	0.
1	0435	56	4228.	*	1	1050	131	74.	*	1	1705	206	0.	*	1	2320	281	0.
1	0440	57	4878.	*	1	1055	132	67.	*	1	1710	207	0.	*	1	2325	282	0.
1	0445	58	5527.	*	1	1100	133	62.	*	1	1715	208	0.	*	1	2330	283	0.
1	0450	59	5970.	*	1	1105	134	56.	*	1	1720	209	0.	*	1	2335	284	0.
1	0455	60	6218.	*	1	1110	135	51.	*	1	1725	210	0.	*	1	2340	285	0.
1	0500	61	6282.	*	1	1115	136	47.	*	1	1730	211	0.	*	1	2345	286	0.
1	0505	62	6304.	*	1	1120	137	42.	*	1	1735	212	0.	*	1	2350	287	0.
1	0510	63	6316.	*	1	1125	138	39.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	6311.	*	1	1130	139	35.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	6307.	*	1	1135	140	32.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	6296.	*	1	1140	141	29.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	6286.	*	1	1145	142	26.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	6288.	*	1	1150	143	24.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	6290.	*	1	1155	144	22.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	6284.	*	1	1200	145	19.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	6258.	*	1	1205	146	18.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	6184.	*	1	1210	147	16.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	6043.	*	1	1215	148	14.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	5829.	*	1	1220	149	13.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	5548.	*	1	1225	150	12.	*	1	1840	225	0.	*	2	0055	300	0.

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PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR

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+   (CFS)       (HR)
                          (CFS)
+    6316.      5.17                2884.        738.        711.         711.
                         (INCHES)      .456        .466        .466         .466
                          (AC-FT)     1430.       1463.       1463.        1463.

                          CUMULATIVE AREA =   58.84 SQ MI
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HYDROGRAPH AT STATION ULWIN
SUM OF 4 HYDROGRAPHS
PLAN 1, RATIO = .57

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DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	3050.	1		1230	151	18.	1		1845	226	0.
1		0005	2	0.	1		0620	77	2952.	1		1235	152	16.	1		1850	227	0.
1		0010	3	0.	1		0625	78	2831.	1		1240	153	15.	1		1855	228	0.
1		0015	4	0.	1		0630	79	2701.	1		1245	154	14.	1		1900	229	0.
1		0020	5	0.	1		0635	80	2552.	1		1250	155	13.	1		1905	230	0.
1		0025	6	0.	1		0640	81	2394.	1		1255	156	12.	1		1910	231	0.
1		0030	7	0.	1		0645	82	2238.	1		1300	157	11.	1		1915	232	0.
1		0035	8	0.	1		0650	83	2086.	1		1305	158	10.	1		1920	233	0.
1		0040	9	0.	1		0655	84	1943.	1		1310	159	9.	1		1925	234	0.
1		0045	10	0.	1		0700	85	1809.	1		1315	160	8.	1		1930	235	0.
1		0050	11	0.	1		0705	86	1687.	1		1320	161	8.	1		1935	236	0.
1		0055	12	0.	1		0710	87	1574.	1		1325	162	7.	1		1940	237	0.
1		0100	13	0.	1		0715	88	1470.	1		1330	163	6.	1		1945	238	0.
1		0105	14	0.	1		0720	89	1373.	1		1335	164	6.	1		1950	239	0.
1		0110	15	0.	1		0725	90	1282.	1		1340	165	5.	1		1955	240	0.
1		0115	16	0.	1		0730	91	1195.	1		1345	166	5.	1		2000	241	0.
1		0120	17	0.	1		0735	92	1113.	1		1350	167	5.	1		2005	242	0.
1		0125	18	0.	1		0740	93	1038.	1		1355	168	4.	1		2010	243	0.
1		0130	19	0.	1		0745	94	968.	1		1400	169	4.	1		2015	244	0.
1		0135	20	0.	1		0750	95	906.	1		1405	170	3.	1		2020	245	0.
1		0140	21	0.	1		0755	96	847.	1		1410	171	3.	1		2025	246	0.
1		0145	22	0.	1		0800	97	792.	1		1415	172	3.	1		2030	247	0.
1		0150	23	0.	1		0805	98	740.	1		1420	173	3.	1		2035	248	0.
1		0155	24	0.	1		0810	99	693.	1		1425	174	2.	1		2040	249	0.
1		0200	25	0.	1		0815	100	649.	1		1430	175	2.	1		2045	250	0.
1		0205	26	0.	1		0820	101	608.	1		1435	176	2.	1		2050	251	0.
1		0210	27	1.	1		0825	102	570.	1		1440	177	2.	1		2055	252	0.
1		0215	28	2.	1		0830	103	534.	1		1445	178	2.	1		2100	253	0.
1		0220	29	3.	1		0835	104	500.	1		1450	179	1.	1		2105	254	0.
1		0225	30	4.	1		0840	105	469.	1		1455	180	1.	1		2110	255	0.
1		0230	31	6.	1		0845	106	440.	1		1500	181	1.	1		2115	256	0.
1		0235	32	8.	1		0850	107	412.	1		1505	182	1.	1		2120	257	0.
1		0240	33	11.	1		0855	108	387.	1		1510	183	1.	1		2125	258	0.
1		0245	34	13.	1		0900	109	363.	1		1515	184	1.	1		2130	259	0.
1		0250	35	15.	1		0905	110	340.	1		1520	185	1.	1		2135	260	0.
1		0255	36	18.	1		0910	111	319.	1		1525	186	1.	1		2140	261	0.
1		0300	37	20.	1		0915	112	300.	1		1530	187	1.	1		2145	262	0.
1		0305	38	24.	1		0920	113	281.	1		1535	188	1.	1		2150	263	0.
1		0310	39	29.	1		0925	114	264.	1		1540	189	0.	1		2155	264	0.
1		0315	40	36.	1		0930	115	248.	1		1545	190	0.	1		2200	265	0.
1		0320	41	47.	1		0935	116	233.	1		1550	191	0.	1		2205	266	0.
1		0325	42	65.	1		0940	117	219.	1		1555	192	0.	1		2210	267	0.
1		0330	43	91.	1		0945	118	205.	1		1600	193	0.	1		2215	268	0.
1		0335	44	130.	1		0950	119	192.	1		1605	194	0.	1		2220	269	0.
1		0340	45	182.	1		0955	120	179.	1		1610	195	0.	1		2225	270	0.
1		0345	46	246.	1		1000	121	165.	1		1615	196	0.	1		2230	271	0.
1		0350	47	322.	1		1005	122	153.	1		1620	197	0.	1		2235	272	0.
1		0355	48	464.	1		1010	123	142.	1		1625	198	0.	1		2240	273	0.
1		0400	49	653.	1		1015	124	131.	1		1630	199	0.	1		2245	274	0.
1		0405	50	822.	1		1020	125	122.	1		1635	200	0.	1		2250	275	0.
1		0410	51	942.	1		1025	126	113.	1		1640	201	0.	1		2255	276	0.
1		0415	52	1025.	1		1030	127	105.	1		1645	202	0.	1		2300	277	0.
1		0420	53	1060.	1		1035	128	97.	1		1650	203	0.	1		2305	278	0.
1		0425	54	1060.	1		1040	129	91.	1		1655	204	0.	1		2310	279	0.
1		0430	55	1039.	1		1045	130	85.	1		1700	205	0.	1		2315	280	0.
1		0435	56	1007.	1		1050	131	79.	1		1705	206	0.	1		2320	281	0.
1		0440	57	971.	1		1055	132	74.	1		1710	207	0.	1		2325	282	0.
1		0445	58	1099.	1		1100	133	69.	1		1715	208	0.	1		2330	283	0.
1		0450	59	1951.	1		1105	134	64.	1		1720	209	0.	1		2335	284	0.
1		0455	60	2095.	1		1110	135	60.	1		1725	210	0.	1		2340	285	0.
1		0500	61	2184.	1		1115	136	56.	1		1730	211	0.	1		2345	286	0.
1		0505	62	2544.	1		1120	137	52.	1		1735	212	0.	1		2350	287	0.

1	0510	63	2620.	*	1	1125	138	49.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	2867.	*	1	1130	139	46.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	2977.	*	1	1135	140	42.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	3001.	*	1	1140	141	40.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	2967.	*	1	1145	142	37.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	3021.	*	1	1150	143	34.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	3057.	*	1	1155	144	31.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	3102.	*	1	1200	145	29.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	3191.	*	1	1205	146	27.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	3239.	*	1	1210	147	25.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	3212.	*	1	1215	148	23.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	3165.	*	1	1220	149	21.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	3117.	*	1	1225	150	19.	*	1	1840	225	0.	*	2	0055	300	0.
				*					*					*				

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PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
+		(CFS)				
+ 3239.	5.92		1477.	382.	368.	368.
		(INCHES)	.233	.241	.241	.241
		(AC-FT)	733.	757.	757.	757.

CUMULATIVE AREA = 58.84 SQ MI

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HYDROGRAPH AT STATION ULWIN
SUM OF 4 HYDROGRAPHS
PLAN 1, RATIO = .44

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DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	*	1		0615	76	1218.	*	1		1230	151	27.	*	1		1845	226	0.
1		0005	2	0.	*	1		0620	77	1194.	*	1		1235	152	25.	*	1		1850	227	0.
1		0010	3	0.	*	1		0625	78	1168.	*	1		1240	153	24.	*	1		1855	228	0.
1		0015	4	0.	*	1		0630	79	1158.	*	1		1245	154	22.	*	1		1900	229	0.
1		0020	5	0.	*	1		0635	80	1161.	*	1		1250	155	21.	*	1		1905	230	0.
1		0025	6	0.	*	1		0640	81	1174.	*	1		1255	156	20.	*	1		1910	231	0.
1		0030	7	0.	*	1		0645	82	1175.	*	1		1300	157	19.	*	1		1915	232	0.
1		0035	8	0.	*	1		0650	83	1151.	*	1		1305	158	17.	*	1		1920	233	0.
1		0040	9	0.	*	1		0655	84	1110.	*	1		1310	159	16.	*	1		1925	234	0.
1		0045	10	0.	*	1		0700	85	1048.	*	1		1315	160	15.	*	1		1930	235	0.
1		0050	11	0.	*	1		0705	86	1001.	*	1		1320	161	14.	*	1		1935	236	0.
1		0055	12	0.	*	1		0710	87	960.	*	1		1325	162	13.	*	1		1940	237	0.
1		0100	13	0.	*	1		0715	88	903.	*	1		1330	163	12.	*	1		1945	238	0.
1		0105	14	0.	*	1		0720	89	851.	*	1		1335	164	12.	*	1		1950	239	0.
1		0110	15	0.	*	1		0725	90	798.	*	1		1340	165	11.	*	1		1955	240	0.
1		0115	16	0.	*	1		0730	91	755.	*	1		1345	166	10.	*	1		2000	241	0.
1		0120	17	0.	*	1		0735	92	718.	*	1		1350	167	9.	*	1		2005	242	0.
1		0125	18	0.	*	1		0740	93	676.	*	1		1355	168	9.	*	1		2010	243	0.
1		0130	19	0.	*	1		0745	94	639.	*	1		1400	169	8.	*	1		2015	244	0.
1		0135	20	0.	*	1		0750	95	605.	*	1		1405	170	8.	*	1		2020	245	0.
1		0140	21	0.	*	1		0755	96	574.	*	1		1410	171	7.	*	1		2025	246	0.
1		0145	22	0.	*	1		0800	97	542.	*	1		1415	172	7.	*	1		2030	247	0.
1		0150	23	0.	*	1		0805	98	510.	*	1		1420	173	6.	*	1		2035	248	0.
1		0155	24	0.	*	1		0810	99	482.	*	1		1425	174	6.	*	1		2040	249	0.
1		0200	25	0.	*	1		0815	100	456.	*	1		1430	175	6.	*	1		2045	250	0.
1		0205	26	0.	*	1		0820	101	429.	*	1		1435	176	5.	*	1		2050	251	0.
1		0210	27	0.	*	1		0825	102	404.	*	1		1440	177	5.	*	1		2055	252	0.
1		0215	28	0.	*	1		0830	103	382.	*	1		1445	178	5.	*	1		2100	253	0.
1		0220	29	0.	*	1		0835	104	361.	*	1		1450	179	4.	*	1		2105	254	0.
1		0225	30	0.	*	1		0840	105	340.	*	1		1455	180	4.	*	1		2110	255	0.
1		0230	31	0.	*	1		0845	106	322.	*	1		1500	181	4.	*	1		2115	256	0.
1		0235	32	0.	*	1		0850	107	305.	*	1		1505	182	3.	*	1		2120	257	0.
1		0240	33	0.	*	1		0855	108	289.	*	1		1510	183	3.	*	1		2125	258	0.
1		0245	34	0.	*	1		0900	109	274.	*	1		1515	184	3.	*	1		2130	259	0.
1		0250	35	0.	*	1		0905	110	260.	*	1		1520	185	3.	*	1		2135	260	0.
1		0255	36	0.	*	1		0910	111	246.	*	1		1525	186	3.	*	1		2140	261	0.
1		0300	37	1.	*	1		0915	112	233.	*	1		1530	187	2.	*	1		2145	262	0.
1		0305	38	1.	*	1		0920	113	221.	*	1		1535	188	2.	*	1		2150	263	0.
1		0310	39	1.	*	1		0925	114	210.	*	1		1540	189	2.	*	1		2155	264	0.
1		0315	40	2.	*	1		0930	115	199.	*	1		1545	190	2.	*	1		2200	265	0.
1		0320	41	4.	*	1		0935	116	189.	*	1		1550	191	2.	*	1		2205	266	0.
1		0325	42	7.	*	1		0940	117	181.	*	1		1555	192	2.	*	1		2210	267	0.
1		0330	43	15.	*	1		0945	118	172.	*	1		1600	193	2.	*	1		2215	268	0.
1		0335	44	29.	*	1		0950	119	164.	*	1		1605	194	2.	*	1		2220	269	0.

1	0340	45	51.	*	1	0955	120	156.	*	1	1610	195	1.	*	1	2225	270	0.
1	0345	46	80.	*	1	1000	121	148.	*	1	1615	196	1.	*	1	2230	271	0.
1	0350	47	114.	*	1	1005	122	141.	*	1	1620	197	1.	*	1	2235	272	0.
1	0355	48	149.	*	1	1010	123	134.	*	1	1625	198	1.	*	1	2240	273	0.
1	0400	49	186.	*	1	1015	124	127.	*	1	1630	199	1.	*	1	2245	274	0.
1	0405	50	226.	*	1	1020	125	121.	*	1	1635	200	1.	*	1	2250	275	0.
1	0410	51	330.	*	1	1025	126	115.	*	1	1640	201	1.	*	1	2255	276	0.
1	0415	52	433.	*	1	1030	127	110.	*	1	1645	202	1.	*	1	2300	277	0.
1	0420	53	475.	*	1	1035	128	105.	*	1	1650	203	1.	*	1	2305	278	0.
1	0425	54	501.	*	1	1040	129	100.	*	1	1655	204	1.	*	1	2310	279	0.
1	0430	55	504.	*	1	1045	130	95.	*	1	1700	205	1.	*	1	2315	280	0.
1	0435	56	497.	*	1	1050	131	90.	*	1	1705	206	1.	*	1	2320	281	0.
1	0440	57	484.	*	1	1055	132	85.	*	1	1710	207	1.	*	1	2325	282	0.
1	0445	58	467.	*	1	1100	133	80.	*	1	1715	208	1.	*	1	2330	283	0.
1	0450	59	451.	*	1	1105	134	75.	*	1	1720	209	0.	*	1	2335	284	0.
1	0455	60	439.	*	1	1110	135	71.	*	1	1725	210	0.	*	1	2340	285	0.
1	0500	61	435.	*	1	1115	136	67.	*	1	1730	211	0.	*	1	2345	286	0.
1	0505	62	439.	*	1	1120	137	63.	*	1	1735	212	0.	*	1	2350	287	0.
1	0510	63	452.	*	1	1125	138	59.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	829.	*	1	1130	139	55.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	1162.	*	1	1135	140	52.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	804.	*	1	1140	141	49.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	1077.	*	1	1145	142	46.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	1095.	*	1	1150	143	43.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	1116.	*	1	1155	144	41.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	1262.	*	1	1200	145	38.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	1147.	*	1	1205	146	36.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	1252.	*	1	1210	147	34.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	1251.	*	1	1215	148	32.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	1285.	*	1	1220	149	30.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	1216.	*	1	1225	150	29.	*	1	1840	225	0.	*	2	0055	300	0.

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PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
+ 1285.	6.08	(CFS)	655.	175.	168.	168.
		(INCHES)	.104	.110	.110	.110
		(AC-FT)	325.	347.	347.	347.

CUMULATIVE AREA = 58.84 SQ MI

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HYDROGRAPH AT STATION ULWIN
SUM OF 4 HYDROGRAPHS
PLAN 1, RATIO = .26

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DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	71.	1		1230	151	13.	1		1845	226	1.
1		0005	2	0.	1		0620	77	64.	1		1235	152	13.	1		1850	227	1.
1		0010	3	0.	1		0625	78	57.	1		1240	153	13.	1		1855	228	1.
1		0015	4	0.	1		0630	79	51.	1		1245	154	12.	1		1900	229	1.
1		0020	5	0.	1		0635	80	46.	1		1250	155	12.	1		1905	230	1.
1		0025	6	0.	1		0640	81	41.	1		1255	156	12.	1		1910	231	0.
1		0030	7	0.	1		0645	82	37.	1		1300	157	11.	1		1915	232	0.
1		0035	8	0.	1		0650	83	33.	1		1305	158	11.	1		1920	233	0.
1		0040	9	0.	1		0655	84	30.	1		1310	159	10.	1		1925	234	0.
1		0045	10	0.	1		0700	85	27.	1		1315	160	10.	1		1930	235	0.
1		0050	11	0.	1		0705	86	24.	1		1320	161	10.	1		1935	236	0.
1		0055	12	0.	1		0710	87	90.	1		1325	162	9.	1		1940	237	0.
1		0100	13	0.	1		0715	88	113.	1		1330	163	9.	1		1945	238	0.
1		0105	14	0.	1		0720	89	83.	1		1335	164	9.	1		1950	239	0.
1		0110	15	0.	1		0725	90	127.	1		1340	165	8.	1		1955	240	0.
1		0115	16	0.	1		0730	91	74.	1		1345	166	8.	1		2000	241	0.
1		0120	17	0.	1		0735	92	74.	1		1350	167	8.	1		2005	242	0.
1		0125	18	0.	1		0740	93	100.	1		1355	168	7.	1		2010	243	0.
1		0130	19	0.	1		0745	94	56.	1		1400	169	7.	1		2015	244	0.
1		0135	20	0.	1		0750	95	78.	1		1405	170	7.	1		2020	245	0.
1		0140	21	0.	1		0755	96	75.	1		1410	171	7.	1		2025	246	0.
1		0145	22	0.	1		0800	97	64.	1		1415	172	6.	1		2030	247	0.
1		0150	23	0.	1		0805	98	107.	1		1420	173	6.	1		2035	248	0.
1		0155	24	0.	1		0810	99	98.	1		1425	174	6.	1		2040	249	0.
1		0200	25	0.	1		0815	100	96.	1		1430	175	6.	1		2045	250	0.
1		0205	26	0.	1		0820	101	83.	1		1435	176	5.	1		2050	251	0.

1	0210	27	0.	*	1	0825	102	65.	*	1	1440	177	5.	*	1	2055	252	0.
1	0215	28	0.	*	1	0830	103	89.	*	1	1445	178	5.	*	1	2100	253	0.
1	0220	29	0.	*	1	0835	104	83.	*	1	1450	179	5.	*	1	2105	254	0.
1	0225	30	0.	*	1	0840	105	76.	*	1	1455	180	5.	*	1	2110	255	0.
1	0230	31	0.	*	1	0845	106	65.	*	1	1500	181	4.	*	1	2115	256	0.
1	0235	32	0.	*	1	0850	107	57.	*	1	1505	182	4.	*	1	2120	257	0.
1	0240	33	0.	*	1	0855	108	73.	*	1	1510	183	4.	*	1	2125	258	0.
1	0245	34	0.	*	1	0900	109	67.	*	1	1515	184	4.	*	1	2130	259	0.
1	0250	35	0.	*	1	0905	110	57.	*	1	1520	185	4.	*	1	2135	260	0.
1	0255	36	0.	*	1	0910	111	52.	*	1	1525	186	3.	*	1	2140	261	0.
1	0300	37	0.	*	1	0915	112	53.	*	1	1530	187	3.	*	1	2145	262	0.
1	0305	38	0.	*	1	0920	113	60.	*	1	1535	188	3.	*	1	2150	263	0.
1	0310	39	0.	*	1	0925	114	50.	*	1	1540	189	3.	*	1	2155	264	0.
1	0315	40	0.	*	1	0930	115	46.	*	1	1545	190	3.	*	1	2200	265	0.
1	0320	41	0.	*	1	0935	116	52.	*	1	1550	191	3.	*	1	2205	266	0.
1	0325	42	0.	*	1	0940	117	54.	*	1	1555	192	3.	*	1	2210	267	0.
1	0330	43	0.	*	1	0945	118	48.	*	1	1600	193	3.	*	1	2215	268	0.
1	0335	44	0.	*	1	0950	119	42.	*	1	1605	194	2.	*	1	2220	269	0.
1	0340	45	0.	*	1	0955	120	46.	*	1	1610	195	2.	*	1	2225	270	0.
1	0345	46	0.	*	1	1000	121	42.	*	1	1615	196	2.	*	1	2230	271	0.
1	0350	47	0.	*	1	1005	122	36.	*	1	1620	197	2.	*	1	2235	272	0.
1	0355	48	1.	*	1	1010	123	36.	*	1	1625	198	2.	*	1	2240	273	0.
1	0400	49	5.	*	1	1015	124	40.	*	1	1630	199	2.	*	1	2245	274	0.
1	0405	50	11.	*	1	1020	125	35.	*	1	1635	200	2.	*	1	2250	275	0.
1	0410	51	19.	*	1	1025	126	31.	*	1	1640	201	2.	*	1	2255	276	0.
1	0415	52	26.	*	1	1030	127	33.	*	1	1645	202	2.	*	1	2300	277	0.
1	0420	53	32.	*	1	1035	128	33.	*	1	1650	203	2.	*	1	2305	278	0.
1	0425	54	36.	*	1	1040	129	28.	*	1	1655	204	2.	*	1	2310	279	0.
1	0430	55	40.	*	1	1045	130	27.	*	1	1700	205	2.	*	1	2315	280	0.
1	0435	56	43.	*	1	1050	131	29.	*	1	1705	206	2.	*	1	2320	281	0.
1	0440	57	44.	*	1	1055	132	27.	*	1	1710	207	1.	*	1	2325	282	0.
1	0445	58	46.	*	1	1100	133	24.	*	1	1715	208	1.	*	1	2330	283	0.
1	0450	59	53.	*	1	1105	134	24.	*	1	1720	209	1.	*	1	2335	284	0.
1	0455	60	72.	*	1	1110	135	24.	*	1	1725	210	1.	*	1	2340	285	0.
1	0500	61	68.	*	1	1115	136	22.	*	1	1730	211	1.	*	1	2345	286	0.
1	0505	62	70.	*	1	1120	137	21.	*	1	1735	212	1.	*	1	2350	287	0.
1	0510	63	77.	*	1	1125	138	20.	*	1	1740	213	1.	*	1	2355	288	0.
1	0515	64	77.	*	1	1130	139	20.	*	1	1745	214	1.	*	2	0000	289	0.
1	0520	65	81.	*	1	1135	140	20.	*	1	1750	215	1.	*	2	0005	290	0.
1	0525	66	84.	*	1	1140	141	18.	*	1	1755	216	1.	*	2	0010	291	0.
1	0530	67	88.	*	1	1145	142	18.	*	1	1800	217	1.	*	2	0015	292	0.
1	0535	68	93.	*	1	1150	143	18.	*	1	1805	218	1.	*	2	0020	293	0.
1	0540	69	99.	*	1	1155	144	17.	*	1	1810	219	1.	*	2	0025	294	0.
1	0545	70	105.	*	1	1200	145	16.	*	1	1815	220	1.	*	2	0030	295	0.
1	0550	71	105.	*	1	1205	146	16.	*	1	1820	221	1.	*	2	0035	296	0.
1	0555	72	101.	*	1	1210	147	15.	*	1	1825	222	1.	*	2	0040	297	0.
1	0600	73	95.	*	1	1215	148	14.	*	1	1830	223	1.	*	2	0045	298	0.
1	0605	74	87.	*	1	1220	149	14.	*	1	1835	224	1.	*	2	0050	299	0.
1	0610	75	79.	*	1	1225	150	14.	*	1	1840	225	1.	*	2	0055	300	0.
				*					*					*				

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PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)				
		(CFS)			
+ 127.	7.42	66.	20.	19.	19.
		(INCHES) .010	.013	.013	.013
		(AC-FT) 33.	40.	40.	40.

CUMULATIVE AREA = 58.84 SQ MI

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              **************
              *            *
1305 KK       *   FINISH   *
              *            *
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1307 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE

HYDROGRAPH ROUTING DATA

1306 RD MUSKINGUM-CUNGE CHANNEL ROUTING

L	1500.	CHANNEL LENGTH
S	.0090	SLOPE
N	.050	CHANNEL ROUGHNESS COEFFICIENT
CA	.00	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	250.00	BOTTOM WIDTH OR DIAMETER
Z	3.00	SIDE SLOPE

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COMPUTED MUSKINGUM-CUNGE PARAMETERS

ELEMENT	ALPHA	M	COMPUTATION TIME STEP DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	.08	1.64	2.60	750.00	9685.89	325.15	.99	9.61

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

MAIN	.08	1.64	5.00		9684.64	325.00	.99	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4684E+04 EXCESS= .0000E+00 OUTFLOW= .4684E+04 BASIN STORAGE= .1032E-01 PERCENT ERROR= .0

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HYDROGRAPH AT STATION FINISH
PLAN 1, RATIO = 1.00

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DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	7836.	1		1230	151	2606.	1		1845	226	86.
1		0005	2	0.	1		0620	77	7615.	1		1235	152	2582.	1		1850	227	65.
1		0010	3	0.	1		0625	78	7400.	1		1240	153	2558.	1		1855	228	49.
1		0015	4	0.	1		0630	79	7191.	1		1245	154	2534.	1		1900	229	37.
1		0020	5	0.	1		0635	80	6988.	1		1250	155	2510.	1		1905	230	28.
1		0025	6	0.	1		0640	81	6790.	1		1255	156	2485.	1		1910	231	21.
1		0030	7	0.	1		0645	82	6597.	1		1300	157	2459.	1		1915	232	16.
1		0035	8	0.	1		0650	83	6411.	1		1305	158	2433.	1		1920	233	12.
1		0040	9	0.	1		0655	84	6233.	1		1310	159	2407.	1		1925	234	9.
1		0045	10	0.	1		0700	85	6061.	1		1315	160	2381.	1		1930	235	7.
1		0050	11	1.	1		0705	86	5896.	1		1320	161	2356.	1		1935	236	5.
1		0055	12	2.	1		0710	87	5739.	1		1325	162	2331.	1		1940	237	4.
1		0100	13	3.	1		0715	88	5589.	1		1330	163	2305.	1		1945	238	3.
1		0105	14	6.	1		0720	89	5447.	1		1335	164	2277.	1		1950	239	2.
1		0110	15	10.	1		0725	90	5311.	1		1340	165	2249.	1		1955	240	2.
1		0115	16	16.	1		0730	91	5180.	1		1345	166	2221.	1		2000	241	1.
1		0120	17	24.	1		0735	92	5053.	1		1350	167	2193.	1		2005	242	1.
1		0125	18	33.	1		0740	93	4931.	1		1355	168	2165.	1		2010	243	1.
1		0130	19	44.	1		0745	94	4814.	1		1400	169	2138.	1		2015	244	1.
1		0135	20	58.	1		0750	95	4704.	1		1405	170	2109.	1		2020	245	0.
1		0140	21	75.	1		0755	96	4601.	1		1410	171	2079.	1		2025	246	0.
1		0145	22	97.	1		0800	97	4504.	1		1415	172	2047.	1		2030	247	0.
1		0150	23	124.	1		0805	98	4415.	1		1420	173	2016.	1		2035	248	0.
1		0155	24	158.	1		0810	99	4333.	1		1425	174	1984.	1		2040	249	0.
1		0200	25	197.	1		0815	100	4256.	1		1430	175	1954.	1		2045	250	0.
1		0205	26	243.	1		0820	101	4183.	1		1435	176	1922.	1		2050	251	0.
1		0210	27	295.	1		0825	102	4115.	1		1440	177	1890.	1		2055	252	0.
1		0215	28	352.	1		0830	103	4050.	1		1445	178	1855.	1		2100	253	0.
1		0220	29	412.	1		0835	104	3990.	1		1450	179	1820.	1		2105	254	0.
1		0225	30	474.	1		0840	105	3933.	1		1455	180	1785.	1		2110	255	0.
1		0230	31	537.	1		0845	106	3879.	1		1500	181	1750.	1		2115	256	0.
1		0235	32	597.	1		0850	107	3828.	1		1505	182	1716.	1		2120	257	0.
1		0240	33	654.	1		0855	108	3780.	1		1510	183	1681.	1		2125	258	0.
1		0245	34	705.	1		0900	109	3734.	1		1515	184	1644.	1		2130	259	0.
1		0250	35	753.	1		0905	110	3690.	1		1520	185	1607.	1		2135	260	0.
1		0255	36	802.	1		0910	111	3648.	1		1525	186	1570.	1		2140	261	0.
1		0300	37	856.	1		0915	112	3608.	1		1530	187	1534.	1		2145	262	0.
1		0305	38	923.	1		0920	113	3570.	1		1535	188	1498.	1		2150	263	0.
1		0310	39	1009.	1		0925	114	3533.	1		1540	189	1461.	1		2155	264	0.
1		0315	40	1128.	1		0930	115	3499.	1		1545	190	1423.	1		2200	265	0.
1		0320	41	1307.	1		0935	116	3466.	1		1550	191	1385.	1		2205	266	0.
1		0325	42	1566.	1		0940	117	3434.	1		1555	192	1347.	1		2210	267	0.
1		0330	43	1926.	1		0945	118	3404.	1		1600	193	1309.	1		2215	268	0.

1	0335	44	2415.	*	1	0950	119	3374.	*	1	1605	194	1273.	*	1	2220	269	0.
1	0340	45	3027.	*	1	0955	120	3346.	*	1	1610	195	1235.	*	1	2225	270	0.
1	0345	46	3722.	*	1	1000	121	3319.	*	1	1615	196	1197.	*	1	2230	271	0.
1	0350	47	4470.	*	1	1005	122	3291.	*	1	1620	197	1157.	*	1	2235	272	0.
1	0355	48	5241.	*	1	1010	123	3264.	*	1	1625	198	1118.	*	1	2240	273	0.
1	0400	49	5975.	*	1	1015	124	3237.	*	1	1630	199	1080.	*	1	2245	274	0.
1	0405	50	6603.	*	1	1020	125	3211.	*	1	1635	200	1043.	*	1	2250	275	0.
1	0410	51	7108.	*	1	1025	126	3185.	*	1	1640	201	1006.	*	1	2255	276	0.
1	0415	52	7497.	*	1	1030	127	3161.	*	1	1645	202	968.	*	1	2300	277	0.
1	0420	53	7784.	*	1	1035	128	3137.	*	1	1650	203	928.	*	1	2305	278	0.
1	0425	54	7982.	*	1	1040	129	3113.	*	1	1655	204	889.	*	1	2310	279	0.
1	0430	55	8117.	*	1	1045	130	3090.	*	1	1700	205	851.	*	1	2315	280	0.
1	0435	56	8222.	*	1	1050	131	3068.	*	1	1705	206	814.	*	1	2320	281	0.
1	0440	57	8315.	*	1	1055	132	3044.	*	1	1710	207	779.	*	1	2325	282	0.
1	0445	58	8399.	*	1	1100	133	3020.	*	1	1715	208	744.	*	1	2330	283	0.
1	0450	59	8500.	*	1	1105	134	2997.	*	1	1720	209	705.	*	1	2335	284	0.
1	0455	60	8654.	*	1	1110	135	2974.	*	1	1725	210	665.	*	1	2340	285	0.
1	0500	61	8858.	*	1	1115	136	2952.	*	1	1730	211	626.	*	1	2345	286	0.
1	0505	62	9079.	*	1	1120	137	2929.	*	1	1735	212	589.	*	1	2350	287	0.
1	0510	63	9295.	*	1	1125	138	2908.	*	1	1740	213	554.	*	1	2355	288	0.
1	0515	64	9486.	*	1	1130	139	2886.	*	1	1745	214	520.	*	2	0000	289	0.
1	0520	65	9623.	*	1	1135	140	2863.	*	1	1750	215	484.	*	2	0005	290	0.
1	0525	66	9685.	*	1	1140	141	2840.	*	1	1755	216	444.	*	2	0010	291	0.
1	0530	67	9670.	*	1	1145	142	2817.	*	1	1800	217	400.	*	2	0015	292	0.
1	0535	68	9588.	*	1	1150	143	2793.	*	1	1805	218	357.	*	2	0020	293	0.
1	0540	69	9451.	*	1	1155	144	2770.	*	1	1810	219	317.	*	2	0025	294	0.
1	0545	70	9268.	*	1	1200	145	2748.	*	1	1815	220	282.	*	2	0030	295	0.
1	0550	71	9051.	*	1	1205	146	2725.	*	1	1820	221	250.	*	2	0035	296	0.
1	0555	72	8813.	*	1	1210	147	2702.	*	1	1825	222	218.	*	2	0040	297	0.
1	0600	73	8565.	*	1	1215	148	2679.	*	1	1830	223	183.	*	2	0045	298	0.
1	0605	74	8314.	*	1	1220	149	2655.	*	1	1835	224	146.	*	2	0050	299	0.
1	0610	75	8069.	*	1	1225	150	2631.	*	1	1840	225	113.	*	2	0055	300	0.

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)	(CFS)				
+ 9685.	5.42		6265.	2361.	2274.	2274.
		(INCHES)	.655	.988	.988	.988
		(AC-FT)	3107.	4684.	4684.	4684.

CUMULATIVE AREA = 88.86 SQ MI

COMPUTED MUSKINGUM-CUNGE PARAMETERS

ELEMENT	ALPHA	M	COMPUTATION TIME STEP DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	.08	1.64	2.82	750.00	7860.77	330.15	.75	8.86

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

MAIN	.08	1.64	5.00		7860.68	330.00	.75

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3556E+04 EXCESS= .0000E+00 OUTFLOW= .3556E+04 BASIN STORAGE= .9648E-02 PERCENT ERROR= .0

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HYDROGRAPH AT STATION FINISH
PLAN 1, RATIO = .87

****

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	6559.	1		1230	151	1936.	1		1845	226	0.
1		0005	2	0.	1		0620	77	6397.	1		1235	152	1902.	1		1850	227	0.
1		0010	3	0.	1		0625	78	6238.	1		1240	153	1866.	1		1855	228	0.
1		0015	4	0.	1		0630	79	6079.	1		1245	154	1830.	1		1900	229	0.
1		0020	5	0.	1		0635	80	5923.	1		1250	155	1793.	1		1905	230	0.
1		0025	6	0.	1		0640	81	5770.	1		1255	156	1758.	1		1910	231	0.
1		0030	7	0.	1		0645	82	5621.	1		1300	157	1723.	1		1915	232	0.
1		0035	8	0.	1		0650	83	5476.	1		1305	158	1686.	1		1920	233	0.

1	0040	9	0.	*	1	0655	84	5336.	*	1	1310	159	1649.	*	1	1925	234	0.
1	0045	10	0.	*	1	0700	85	5200.	*	1	1315	160	1611.	*	1	1930	235	0.
1	0050	11	0.	*	1	0705	86	5070.	*	1	1320	161	1573.	*	1	1935	236	0.
1	0055	12	0.	*	1	0710	87	4945.	*	1	1325	162	1537.	*	1	1940	237	0.
1	0100	13	0.	*	1	0715	88	4826.	*	1	1330	163	1500.	*	1	1945	238	0.
1	0105	14	0.	*	1	0720	89	4711.	*	1	1335	164	1463.	*	1	1950	239	0.
1	0110	15	0.	*	1	0725	90	4602.	*	1	1340	165	1425.	*	1	1955	240	0.
1	0115	16	1.	*	1	0730	91	4496.	*	1	1345	166	1386.	*	1	2000	241	0.
1	0120	17	2.	*	1	0735	92	4393.	*	1	1350	167	1347.	*	1	2005	242	0.
1	0125	18	4.	*	1	0740	93	4293.	*	1	1355	168	1309.	*	1	2010	243	0.
1	0130	19	6.	*	1	0745	94	4197.	*	1	1400	169	1272.	*	1	2015	244	0.
1	0135	20	11.	*	1	0750	95	4106.	*	1	1405	170	1234.	*	1	2020	245	0.
1	0140	21	17.	*	1	0755	96	4020.	*	1	1410	171	1195.	*	1	2025	246	0.
1	0145	22	26.	*	1	0800	97	3940.	*	1	1415	172	1155.	*	1	2030	247	0.
1	0150	23	39.	*	1	0805	98	3865.	*	1	1420	173	1116.	*	1	2035	248	0.
1	0155	24	55.	*	1	0810	99	3795.	*	1	1425	174	1078.	*	1	2040	249	0.
1	0200	25	77.	*	1	0815	100	3730.	*	1	1430	175	1041.	*	1	2045	250	0.
1	0205	26	103.	*	1	0820	101	3668.	*	1	1435	176	1004.	*	1	2050	251	0.
1	0210	27	133.	*	1	0825	102	3608.	*	1	1440	177	966.	*	1	2055	252	0.
1	0215	28	168.	*	1	0830	103	3552.	*	1	1445	178	926.	*	1	2100	253	0.
1	0220	29	206.	*	1	0835	104	3497.	*	1	1450	179	887.	*	1	2105	254	0.
1	0225	30	246.	*	1	0840	105	3445.	*	1	1455	180	849.	*	1	2110	255	0.
1	0230	31	287.	*	1	0845	106	3395.	*	1	1500	181	812.	*	1	2115	256	0.
1	0235	32	328.	*	1	0850	107	3347.	*	1	1505	182	777.	*	1	2120	257	0.
1	0240	33	366.	*	1	0855	108	3302.	*	1	1510	183	741.	*	1	2125	258	0.
1	0245	34	400.	*	1	0900	109	3258.	*	1	1515	184	702.	*	1	2130	259	0.
1	0250	35	432.	*	1	0905	110	3217.	*	1	1520	185	663.	*	1	2135	260	0.
1	0255	36	463.	*	1	0910	111	3177.	*	1	1525	186	624.	*	1	2140	261	0.
1	0300	37	498.	*	1	0915	112	3138.	*	1	1530	187	588.	*	1	2145	262	0.
1	0305	38	543.	*	1	0920	113	3101.	*	1	1535	188	553.	*	1	2150	263	0.
1	0310	39	605.	*	1	0925	114	3065.	*	1	1540	189	520.	*	1	2155	264	0.
1	0315	40	691.	*	1	0930	115	3029.	*	1	1545	190	485.	*	1	2200	265	0.
1	0320	41	816.	*	1	0935	116	2994.	*	1	1550	191	447.	*	1	2205	266	0.
1	0325	42	1001.	*	1	0940	117	2960.	*	1	1555	192	405.	*	1	2210	267	0.
1	0330	43	1261.	*	1	0945	118	2928.	*	1	1600	193	363.	*	1	2215	268	0.
1	0335	44	1610.	*	1	0950	119	2896.	*	1	1605	194	323.	*	1	2220	269	0.
1	0340	45	2049.	*	1	0955	120	2865.	*	1	1610	195	288.	*	1	2225	270	0.
1	0345	46	2573.	*	1	1000	121	2834.	*	1	1615	196	256.	*	1	2230	271	0.
1	0350	47	3163.	*	1	1005	122	2804.	*	1	1620	197	224.	*	1	2235	272	0.
1	0355	48	3791.	*	1	1010	123	2773.	*	1	1625	198	190.	*	1	2240	273	0.
1	0400	49	4405.	*	1	1015	124	2743.	*	1	1630	199	154.	*	1	2245	274	0.
1	0405	50	4936.	*	1	1020	125	2712.	*	1	1635	200	120.	*	1	2250	275	0.
1	0410	51	5362.	*	1	1025	126	2683.	*	1	1640	201	91.	*	1	2255	276	0.
1	0415	52	5697.	*	1	1030	127	2654.	*	1	1645	202	69.	*	1	2300	277	0.
1	0420	53	5949.	*	1	1035	128	2625.	*	1	1650	203	52.	*	1	2305	278	0.
1	0425	54	6116.	*	1	1040	129	2597.	*	1	1655	204	39.	*	1	2310	279	0.
1	0430	55	6216.	*	1	1045	130	2569.	*	1	1700	205	30.	*	1	2315	280	0.
1	0435	56	6290.	*	1	1050	131	2540.	*	1	1705	206	23.	*	1	2320	281	0.
1	0440	57	6369.	*	1	1055	132	2511.	*	1	1710	207	17.	*	1	2325	282	0.
1	0445	58	6461.	*	1	1100	133	2482.	*	1	1715	208	13.	*	1	2330	283	0.
1	0450	59	6586.	*	1	1105	134	2453.	*	1	1720	209	10.	*	1	2335	284	0.
1	0455	60	6763.	*	1	1110	135	2425.	*	1	1725	210	7.	*	1	2340	285	0.
1	0500	61	6979.	*	1	1115	136	2397.	*	1	1730	211	6.	*	1	2345	286	0.
1	0505	62	7205.	*	1	1120	137	2369.	*	1	1735	212	4.	*	1	2350	287	0.
1	0510	63	7422.	*	1	1125	138	2341.	*	1	1740	213	3.	*	1	2355	288	0.
1	0515	64	7614.	*	1	1130	139	2311.	*	1	1745	214	2.	*	2	0000	289	0.
1	0520	65	7758.	*	1	1135	140	2281.	*	1	1750	215	2.	*	2	0005	290	0.
1	0525	66	7840.	*	1	1140	141	2251.	*	1	1755	216	1.	*	2	0010	291	0.
1	0530	67	7861.	*	1	1145	142	2221.	*	1	1800	217	1.	*	2	0015	292	0.
1	0535	68	7822.	*	1	1150	143	2192.	*	1	1805	218	1.	*	2	0020	293	0.
1	0540	69	7735.	*	1	1155	144	2162.	*	1	1810	219	1.	*	2	0025	294	0.
1	0545	70	7609.	*	1	1200	145	2132.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	7455.	*	1	1205	146	2100.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	7283.	*	1	1210	147	2067.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	7101.	*	1	1215	148	2034.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	6915.	*	1	1220	149	2001.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	6732.	*	1	1225	150	1969.	*	1	1840	225	0.	*	2	0055	300	0.
				*					*					*				

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 7861.	5.50		5161.	1793.	1727.	1727.
		(INCHES)	.540	.750	.750	.750
		(AC-FT)	2559.	3556.	3556.	3556.

CUMULATIVE AREA = 88.86 SQ MI

COMPUTED MUSKINGUM-CUNGE PARAMETERS

ELEMENT	ALPHA	COMPUTATION TIME STEP M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	.08	1.64	3.14	750.00	5990.66	332.43	.53	7.97
			INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL					
MAIN	.08	1.64	5.00		5984.42	335.00	.53	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2523E+04 EXCESS= .0000E+00 OUTFLOW= .2523E+04 BASIN STORAGE= .9971E-02 PERCENT ERROR= .0

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HYDROGRAPH AT STATION FINISH
PLAN 1, RATIO = .74

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DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	5182.	1		1230	151	1081.	1		1845	226	0.
1		0005	2	0.	1		0620	77	5072.	1		1235	152	1044.	1		1850	227	0.
1		0010	3	0.	1		0625	78	4964.	1		1240	153	1006.	1		1855	228	0.
1		0015	4	0.	1		0630	79	4856.	1		1245	154	967.	1		1900	229	0.
1		0020	5	0.	1		0635	80	4747.	1		1250	155	926.	1		1905	230	0.
1		0025	6	0.	1		0640	81	4640.	1		1255	156	887.	1		1910	231	0.
1		0030	7	0.	1		0645	82	4533.	1		1300	157	849.	1		1915	232	0.
1		0035	8	0.	1		0650	83	4428.	1		1305	158	812.	1		1920	233	0.
1		0040	9	0.	1		0655	84	4326.	1		1310	159	776.	1		1925	234	0.
1		0045	10	0.	1		0700	85	4226.	1		1315	160	740.	1		1930	235	0.
1		0050	11	0.	1		0705	86	4129.	1		1320	161	701.	1		1935	236	0.
1		0055	12	0.	1		0710	87	4035.	1		1325	162	661.	1		1940	237	0.
1		0100	13	0.	1		0715	88	3945.	1		1330	163	623.	1		1945	238	0.
1		0105	14	0.	1		0720	89	3858.	1		1335	164	586.	1		1950	239	0.
1		0110	15	0.	1		0725	90	3773.	1		1340	165	552.	1		1955	240	0.
1		0115	16	0.	1		0730	91	3691.	1		1345	166	519.	1		2000	241	0.
1		0120	17	0.	1		0735	92	3610.	1		1350	167	485.	1		2005	242	0.
1		0125	18	0.	1		0740	93	3532.	1		1355	168	447.	1		2010	243	0.
1		0130	19	0.	1		0745	94	3456.	1		1400	169	408.	1		2015	244	0.
1		0135	20	0.	1		0750	95	3383.	1		1405	170	368.	1		2020	245	0.
1		0140	21	1.	1		0755	96	3313.	1		1410	171	330.	1		2025	246	0.
1		0145	22	2.	1		0800	97	3247.	1		1415	172	296.	1		2030	247	0.
1		0150	23	4.	1		0805	98	3185.	1		1420	173	264.	1		2035	248	0.
1		0155	24	8.	1		0810	99	3127.	1		1425	174	234.	1		2040	249	0.
1		0200	25	14.	1		0815	100	3071.	1		1430	175	202.	1		2045	250	0.
1		0205	26	23.	1		0820	101	3018.	1		1435	176	167.	1		2050	251	0.
1		0210	27	35.	1		0825	102	2967.	1		1440	177	131.	1		2055	252	0.
1		0215	28	50.	1		0830	103	2917.	1		1445	178	101.	1		2100	253	0.
1		0220	29	68.	1		0835	104	2868.	1		1450	179	77.	1		2105	254	0.
1		0225	30	88.	1		0840	105	2821.	1		1455	180	59.	1		2110	255	0.
1		0230	31	110.	1		0845	106	2775.	1		1500	181	45.	1		2115	256	0.
1		0235	32	133.	1		0850	107	2731.	1		1505	182	34.	1		2120	257	0.
1		0240	33	155.	1		0855	108	2689.	1		1510	183	26.	1		2125	258	0.
1		0245	34	176.	1		0900	109	2648.	1		1515	184	20.	1		2130	259	0.
1		0250	35	195.	1		0905	110	2608.	1		1520	185	15.	1		2135	260	0.
1		0255	36	214.	1		0910	111	2569.	1		1525	186	12.	1		2140	261	0.
1		0300	37	235.	1		0915	112	2531.	1		1530	187	9.	1		2145	262	0.
1		0305	38	261.	1		0920	113	2493.	1		1535	188	7.	1		2150	263	0.
1		0310	39	297.	1		0925	114	2456.	1		1540	189	5.	1		2155	264	0.
1		0315	40	348.	1		0930	115	2419.	1		1545	190	4.	1		2200	265	0.
1		0320	41	419.	1		0935	116	2383.	1		1550	191	3.	1		2205	266	0.
1		0325	42	531.	1		0940	117	2347.	1		1555	192	3.	1		2210	267	0.
1		0330	43	690.	1		0945	118	2313.	1		1600	193	2.	1		2215	268	0.
1		0335	44	925.	1		0950	119	2279.	1		1605	194	2.	1		2220	269	0.
1		0340	45	1242.	1		0955	120	2245.	1		1610	195	1.	1		2225	270	0.
1		0345	46	1618.	1		1000	121	2209.	1		1615	196	1.	1		2230	271	0.
1		0350	47	2044.	1		1005	122	2173.	1		1620	197	1.	1		2235	272	0.
1		0355	48	2499.	1		1010	123	2137.	1		1625	198	1.	1		2240	273	0.
1		0400	49	2947.	1		1015	124	2101.	1		1630	199	0.	1		2245	274	0.
1		0405	50	3354.	1		1020	125	2066.	1		1635	200	0.	1		2250	275	0.
1		0410	51	3709.	1		1025	126	2031.	1		1640	201	0.	1		2255	276	0.
1		0415	52	4000.	1		1030	127	1996.	1		1645	202	0.	1		2300	277	0.
1		0420	53	4220.	1		1035	128	1960.	1		1650	203	0.	1		2305	278	0.
1		0425	54	4369.	1		1040	129	1922.	1		1655	204	0.	1		2310	279	0.

1	0430	55	4455.	*	1	1045	130	1884.	*	1	1700	205	0.	*	1	2315	280	0.
1	0435	56	4504.	*	1	1050	131	1847.	*	1	1705	206	0.	*	1	2320	281	0.
1	0440	57	4542.	*	1	1055	132	1810.	*	1	1710	207	0.	*	1	2325	282	0.
1	0445	58	4594.	*	1	1100	133	1774.	*	1	1715	208	0.	*	1	2330	283	0.
1	0450	59	4685.	*	1	1105	134	1737.	*	1	1720	209	0.	*	1	2335	284	0.
1	0455	60	4831.	*	1	1110	135	1699.	*	1	1725	210	0.	*	1	2340	285	0.
1	0500	61	5028.	*	1	1115	136	1660.	*	1	1730	211	0.	*	1	2345	286	0.
1	0505	62	5247.	*	1	1120	137	1622.	*	1	1735	212	0.	*	1	2350	287	0.
1	0510	63	5464.	*	1	1125	138	1584.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	5661.	*	1	1130	139	1547.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	5822.	*	1	1135	140	1510.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	5928.	*	1	1140	141	1471.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	5980.	*	1	1145	142	1432.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	5984.	*	1	1150	143	1392.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	5948.	*	1	1155	144	1354.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	5876.	*	1	1200	145	1316.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	5780.	*	1	1205	146	1278.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	5667.	*	1	1210	147	1239.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	5546.	*	1	1215	148	1199.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	5421.	*	1	1220	149	1159.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	5297.	*	1	1225	150	1120.	*	1	1840	225	0.	*	2	0055	300	0.

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 5984.	5.58		3992.	1272.	1225.	1225.
		(INCHES)	.418	.532	.532	.532
		(AC-FT)	1979.	2523.	2523.	2523.

CUMULATIVE AREA = 88.86 SQ MI

COMPUTED MUSKINGUM-CUNGE PARAMETERS

ELEMENT	ALPHA	M	COMPUTATION TIME STEP DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	.08	1.64	3.87	750.00	3481.46	340.90	.29	6.45
INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL								
MAIN	.08	1.64	5.00		3480.15	340.00	.29	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1359E+04 EXCESS= .0000E+00 OUTFLOW= .1359E+04 BASIN STORAGE= .9865E-02 PERCENT ERROR= .0

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HYDROGRAPH AT STATION FINISH
PLAN 1, RATIO = .57

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DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	3196.	1		1230	151	189.	1		1845	226	0.
1		0005	2	0.	1		0620	77	3150.	1		1235	152	159.	1		1850	227	0.
1		0010	3	0.	1		0625	78	3106.	1		1240	153	131.	1		1855	228	0.
1		0015	4	0.	1		0630	79	3061.	1		1245	154	107.	1		1900	229	0.
1		0020	5	0.	1		0635	80	3015.	1		1250	155	88.	1		1905	230	0.
1		0025	6	0.	1		0640	81	2966.	1		1255	156	73.	1		1910	231	0.
1		0030	7	0.	1		0645	82	2915.	1		1300	157	61.	1		1915	232	0.
1		0035	8	0.	1		0650	83	2862.	1		1305	158	52.	1		1920	233	0.
1		0040	9	0.	1		0655	84	2809.	1		1310	159	45.	1		1925	234	0.
1		0045	10	0.	1		0700	85	2755.	1		1315	160	39.	1		1930	235	0.
1		0050	11	0.	1		0705	86	2701.	1		1320	161	34.	1		1935	236	0.
1		0055	12	0.	1		0710	87	2647.	1		1325	162	30.	1		1940	237	0.
1		0100	13	0.	1		0715	88	2594.	1		1330	163	26.	1		1945	238	0.
1		0105	14	0.	1		0720	89	2541.	1		1335	164	24.	1		1950	239	0.
1		0110	15	0.	1		0725	90	2489.	1		1340	165	21.	1		1955	240	0.
1		0115	16	0.	1		0730	91	2437.	1		1345	166	19.	1		2000	241	0.
1		0120	17	0.	1		0735	92	2385.	1		1350	167	17.	1		2005	242	0.
1		0125	18	0.	1		0740	93	2333.	1		1355	168	16.	1		2010	243	0.
1		0130	19	0.	1		0745	94	2281.	1		1400	169	14.	1		2015	244	0.

1	0135	20	0.	*	1	0750	95	2231.	*	1	1405	170	13.	*	1	2020	245	0.
1	0140	21	0.	*	1	0755	96	2182.	*	1	1410	171	12.	*	1	2025	246	0.
1	0145	22	0.	*	1	0800	97	2134.	*	1	1415	172	11.	*	1	2030	247	0.
1	0150	23	0.	*	1	0805	98	2087.	*	1	1420	173	10.	*	1	2035	248	0.
1	0155	24	0.	*	1	0810	99	2041.	*	1	1425	174	9.	*	1	2040	249	0.
1	0200	25	0.	*	1	0815	100	1995.	*	1	1430	175	8.	*	1	2045	250	0.
1	0205	26	0.	*	1	0820	101	1951.	*	1	1435	176	7.	*	1	2050	251	0.
1	0210	27	0.	*	1	0825	102	1907.	*	1	1440	177	7.	*	1	2055	252	0.
1	0215	28	1.	*	1	0830	103	1865.	*	1	1445	178	6.	*	1	2100	253	0.
1	0220	29	2.	*	1	0835	104	1823.	*	1	1450	179	6.	*	1	2105	254	0.
1	0225	30	3.	*	1	0840	105	1783.	*	1	1455	180	5.	*	1	2110	255	0.
1	0230	31	5.	*	1	0845	106	1743.	*	1	1500	181	5.	*	1	2115	256	0.
1	0235	32	8.	*	1	0850	107	1705.	*	1	1505	182	4.	*	1	2120	257	0.
1	0240	33	12.	*	1	0855	108	1666.	*	1	1510	183	4.	*	1	2125	258	0.
1	0245	34	17.	*	1	0900	109	1627.	*	1	1515	184	4.	*	1	2130	259	0.
1	0250	35	21.	*	1	0905	110	1587.	*	1	1520	185	3.	*	1	2135	260	0.
1	0255	36	27.	*	1	0910	111	1547.	*	1	1525	186	3.	*	1	2140	261	0.
1	0300	37	34.	*	1	0915	112	1508.	*	1	1530	187	3.	*	1	2145	262	0.
1	0305	38	42.	*	1	0920	113	1470.	*	1	1535	188	2.	*	1	2150	263	0.
1	0310	39	54.	*	1	0925	114	1434.	*	1	1540	189	2.	*	1	2155	264	0.
1	0315	40	72.	*	1	0930	115	1397.	*	1	1545	190	2.	*	1	2200	265	0.
1	0320	41	98.	*	1	0935	116	1362.	*	1	1550	191	2.	*	1	2205	266	0.
1	0325	42	138.	*	1	0940	117	1325.	*	1	1555	192	2.	*	1	2210	267	0.
1	0330	43	197.	*	1	0945	118	1288.	*	1	1600	193	2.	*	1	2215	268	0.
1	0335	44	290.	*	1	0950	119	1249.	*	1	1605	194	1.	*	1	2220	269	0.
1	0340	45	436.	*	1	0955	120	1212.	*	1	1610	195	1.	*	1	2225	270	0.
1	0345	46	626.	*	1	1000	121	1175.	*	1	1615	196	1.	*	1	2230	271	0.
1	0350	47	862.	*	1	1005	122	1139.	*	1	1620	197	1.	*	1	2235	272	0.
1	0355	48	1126.	*	1	1010	123	1104.	*	1	1625	198	1.	*	1	2240	273	0.
1	0400	49	1391.	*	1	1015	124	1070.	*	1	1630	199	1.	*	1	2245	274	0.
1	0405	50	1637.	*	1	1020	125	1034.	*	1	1635	200	1.	*	1	2250	275	0.
1	0410	51	1852.	*	1	1025	126	997.	*	1	1640	201	1.	*	1	2255	276	0.
1	0415	52	2041.	*	1	1030	127	959.	*	1	1645	202	1.	*	1	2300	277	0.
1	0420	53	2200.	*	1	1035	128	922.	*	1	1650	203	1.	*	1	2305	278	0.
1	0425	54	2323.	*	1	1040	129	887.	*	1	1655	204	1.	*	1	2310	279	0.
1	0430	55	2420.	*	1	1045	130	853.	*	1	1700	205	0.	*	1	2315	280	0.
1	0435	56	2494.	*	1	1050	131	819.	*	1	1705	206	0.	*	1	2320	281	0.
1	0440	57	2537.	*	1	1055	132	786.	*	1	1710	207	0.	*	1	2325	282	0.
1	0445	58	2558.	*	1	1100	133	751.	*	1	1715	208	0.	*	1	2330	283	0.
1	0450	59	2584.	*	1	1105	134	714.	*	1	1720	209	0.	*	1	2335	284	0.
1	0455	60	2633.	*	1	1110	135	677.	*	1	1725	210	0.	*	1	2340	285	0.
1	0500	61	2717.	*	1	1115	136	641.	*	1	1730	211	0.	*	1	2345	286	0.
1	0505	62	2832.	*	1	1120	137	607.	*	1	1735	212	0.	*	1	2350	287	0.
1	0510	63	2969.	*	1	1125	138	575.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	3116.	*	1	1130	139	544.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	3246.	*	1	1135	140	514.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	3352.	*	1	1140	141	481.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	3427.	*	1	1145	142	445.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	3466.	*	1	1150	143	408.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	3480.	*	1	1155	144	372.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	3472.	*	1	1200	145	340.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	3441.	*	1	1205	146	312.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	3396.	*	1	1210	147	286.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	3348.	*	1	1215	148	262.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	3297.	*	1	1220	149	239.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	3245.	*	1	1225	150	216.	*	1	1840	225	0.	*	2	0055	300	0.
				*					*					*				

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PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)				
		(CFS)			
+ 3480.	5.67	2386.	685.	660.	660.
		(INCHES) .250	.287	.287	.287
		(AC-FT) 1183.	1359.	1359.	1359.

CUMULATIVE AREA = 88.86 SQ MI

COMPUTED MUSKINGUM-CUNGE PARAMETERS

ELEMENT	ALPHA	M	COMPUTATION TIME STEP DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	.08	1.64	5.00	750.00	1757.50	345.00	.14	4.95

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

MAIN .08 1.64 5.00 1757.50 345.00 .14

CONTINUITY SUMMARY (AC-FT) - INFLOW= .6593E+03 EXCESS= .0000E+00 OUTFLOW= .6594E+03 BASIN STORAGE= .1003E-01 PERCENT ERROR= .0

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HYDROGRAPH AT STATION FINISH
PLAN 1, RATIO = .44

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DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	1655.	1		1230	151	63.	1		1845	226	0.
1		0005	2	0.	1		0620	77	1638.	1		1235	152	59.	1		1850	227	0.
1		0010	3	0.	1		0625	78	1616.	1		1240	153	56.	1		1855	228	0.
1		0015	4	0.	1		0630	79	1596.	1		1245	154	52.	1		1900	229	0.
1		0020	5	0.	1		0635	80	1573.	1		1250	155	49.	1		1905	230	0.
1		0025	6	0.	1		0640	81	1551.	1		1255	156	46.	1		1910	231	0.
1		0030	7	0.	1		0645	82	1526.	1		1300	157	44.	1		1915	232	0.
1		0035	8	0.	1		0650	83	1502.	1		1305	158	41.	1		1920	233	0.
1		0040	9	0.	1		0655	84	1478.	1		1310	159	39.	1		1925	234	0.
1		0045	10	0.	1		0700	85	1455.	1		1315	160	37.	1		1930	235	0.
1		0050	11	0.	1		0705	86	1434.	1		1320	161	35.	1		1935	236	0.
1		0055	12	0.	1		0710	87	1412.	1		1325	162	33.	1		1940	237	0.
1		0100	13	0.	1		0715	88	1390.	1		1330	163	31.	1		1945	238	0.
1		0105	14	0.	1		0720	89	1367.	1		1335	164	29.	1		1950	239	0.
1		0110	15	0.	1		0725	90	1343.	1		1340	165	27.	1		1955	240	0.
1		0115	16	0.	1		0730	91	1317.	1		1345	166	26.	1		2000	241	0.
1		0120	17	0.	1		0735	92	1291.	1		1350	167	24.	1		2005	242	0.
1		0125	18	0.	1		0740	93	1264.	1		1355	168	23.	1		2010	243	0.
1		0130	19	0.	1		0745	94	1235.	1		1400	169	21.	1		2015	244	0.
1		0135	20	0.	1		0750	95	1205.	1		1405	170	20.	1		2020	245	0.
1		0140	21	0.	1		0755	96	1176.	1		1410	171	19.	1		2025	246	0.
1		0145	22	0.	1		0800	97	1147.	1		1415	172	18.	1		2030	247	0.
1		0150	23	0.	1		0805	98	1118.	1		1420	173	16.	1		2035	248	0.
1		0155	24	0.	1		0810	99	1089.	1		1425	174	15.	1		2040	249	0.
1		0200	25	0.	1		0815	100	1061.	1		1430	175	14.	1		2045	250	0.
1		0205	26	0.	1		0820	101	1034.	1		1435	176	13.	1		2050	251	0.
1		0210	27	0.	1		0825	102	1006.	1		1440	177	13.	1		2055	252	0.
1		0215	28	0.	1		0830	103	979.	1		1445	178	12.	1		2100	253	0.
1		0220	29	0.	1		0835	104	953.	1		1450	179	11.	1		2105	254	0.
1		0225	30	0.	1		0840	105	926.	1		1455	180	10.	1		2110	255	0.
1		0230	31	0.	1		0845	106	901.	1		1500	181	10.	1		2115	256	0.
1		0235	32	0.	1		0850	107	875.	1		1505	182	9.	1		2120	257	0.
1		0240	33	0.	1		0855	108	849.	1		1510	183	8.	1		2125	258	0.
1		0245	34	0.	1		0900	109	821.	1		1515	184	8.	1		2130	259	0.
1		0250	35	0.	1		0905	110	791.	1		1520	185	7.	1		2135	260	0.
1		0255	36	0.	1		0910	111	760.	1		1525	186	7.	1		2140	261	0.
1		0300	37	0.	1		0915	112	731.	1		1530	187	7.	1		2145	262	0.
1		0305	38	0.	1		0920	113	704.	1		1535	188	6.	1		2150	263	0.
1		0310	39	1.	1		0925	114	677.	1		1540	189	6.	1		2155	264	0.
1		0315	40	2.	1		0930	115	651.	1		1545	190	5.	1		2200	265	0.
1		0320	41	5.	1		0935	116	626.	1		1550	191	5.	1		2205	266	0.
1		0325	42	11.	1		0940	117	602.	1		1555	192	5.	1		2210	267	0.
1		0330	43	22.	1		0945	118	579.	1		1600	193	4.	1		2215	268	0.
1		0335	44	44.	1		0950	119	556.	1		1605	194	4.	1		2220	269	0.
1		0340	45	82.	1		0955	120	533.	1		1610	195	4.	1		2225	270	0.
1		0345	46	141.	1		1000	121	509.	1		1615	196	4.	1		2230	271	0.
1		0350	47	244.	1		1005	122	481.	1		1620	197	3.	1		2235	272	0.
1		0355	48	368.	1		1010	123	450.	1		1625	198	3.	1		2240	273	0.
1		0400	49	509.	1		1015	124	420.	1		1630	199	3.	1		2245	274	0.
1		0405	50	656.	1		1020	125	394.	1		1635	200	3.	1		2250	275	0.
1		0410	51	780.	1		1025	126	371.	1		1640	201	3.	1		2255	276	0.
1		0415	52	883.	1		1030	127	348.	1		1645	202	3.	1		2300	277	0.
1		0420	53	967.	1		1035	128	328.	1		1650	203	2.	1		2305	278	0.
1		0425	54	1038.	1		1040	129	309.	1		1655	204	2.	1		2310	279	0.
1		0430	55	1098.	1		1045	130	291.	1		1700	205	2.	1		2315	280	0.
1		0435	56	1154.	1		1050	131	275.	1		1705	206	2.	1		2320	281	0.
1		0440	57	1208.	1		1055	132	259.	1		1710	207	2.	1		2325	282	0.
1		0445	58	1254.	1		1100	133	245.	1		1715	208	2.	1		2330	283	0.
1		0450	59	1287.	1		1105	134	232.	1		1720	209	2.	1		2335	284	0.
1		0455	60	1326.	1		1110	135	218.	1		1725	210	2.	1		2340	285	0.
1		0500	61	1388.	1		1115	136	202.	1		1730	211	1.	1		2345	286	0.
1		0505	62	1454.	1		1120	137	183.	1		1735	212	1.	1		2350	287	0.
1		0510	63	1522.	1		1125	138	166.	1		1740	213	1.	1		2355	288	0.
1		0515	64	1586.	1		1130	139	152.	1		1745	214	1.	2		0000	289	0.
1		0520	65	1640.	1		1135	140	139.	1		1750	215	1.	2		0005	290	0.

1	0525	66	1678.	*	1	1140	141	127.	*	1	1755	216	1.	*	2	0010	291	0.
1	0530	67	1700.	*	1	1145	142	117.	*	1	1800	217	1.	*	2	0015	292	0.
1	0535	68	1718.	*	1	1150	143	108.	*	1	1805	218	1.	*	2	0020	293	0.
1	0540	69	1741.	*	1	1155	144	100.	*	1	1810	219	1.	*	2	0025	294	0.
1	0545	70	1757.	*	1	1200	145	93.	*	1	1815	220	1.	*	2	0030	295	0.
1	0550	71	1747.	*	1	1205	146	87.	*	1	1820	221	1.	*	2	0035	296	0.
1	0555	72	1721.	*	1	1210	147	81.	*	1	1825	222	1.	*	2	0040	297	0.
1	0600	73	1706.	*	1	1215	148	76.	*	1	1830	223	1.	*	2	0045	298	0.
1	0605	74	1693.	*	1	1220	149	71.	*	1	1835	224	1.	*	2	0050	299	0.
1	0610	75	1672.	*	1	1225	150	67.	*	1	1840	225	1.	*	2	0055	300	0.
				*					*					*				

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 1757.	5.75		1207.	332.	320.	320.
		(INCHES)	.126	.139	.139	.139
		(AC-FT)	598.	659.	659.	659.

CUMULATIVE AREA = 88.86 SQ MI

COMPUTED MUSKINGUM-CUNGE PARAMETERS
COMPUTATION TIME STEP

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	.08	1.64	5.00	375.00	286.45	355.00	.02	2.45

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

MAIN	.08	1.64	5.00	286.45	355.00	.02	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .8690E+02 EXCESS= .0000E+00 OUTFLOW= .8692E+02 BASIN STORAGE= .4200E-01 PERCENT ERROR= -.1

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HYDROGRAPH AT STATION FINISH
PLAN 1, RATIO = .26

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DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	*	1		0615	76	253.	*	1		1230	151	27.	*	1		1845	226	2.
1		0005	2	0.	*	1		0620	77	250.	*	1		1235	152	26.	*	1		1850	227	2.
1		0010	3	0.	*	1		0625	78	243.	*	1		1240	153	26.	*	1		1855	228	2.
1		0015	4	0.	*	1		0630	79	240.	*	1		1245	154	25.	*	1		1900	229	2.
1		0020	5	0.	*	1		0635	80	237.	*	1		1250	155	24.	*	1		1905	230	2.
1		0025	6	0.	*	1		0640	81	229.	*	1		1255	156	23.	*	1		1910	231	2.
1		0030	7	0.	*	1		0645	82	222.	*	1		1300	157	22.	*	1		1915	232	2.
1		0035	8	0.	*	1		0650	83	211.	*	1		1305	158	22.	*	1		1920	233	2.
1		0040	9	0.	*	1		0655	84	201.	*	1		1310	159	21.	*	1		1925	234	2.
1		0045	10	0.	*	1		0700	85	190.	*	1		1315	160	20.	*	1		1930	235	1.
1		0050	11	0.	*	1		0705	86	179.	*	1		1320	161	20.	*	1		1935	236	1.
1		0055	12	0.	*	1		0710	87	168.	*	1		1325	162	19.	*	1		1940	237	1.
1		0100	13	0.	*	1		0715	88	158.	*	1		1330	163	19.	*	1		1945	238	1.
1		0105	14	0.	*	1		0720	89	148.	*	1		1335	164	18.	*	1		1950	239	1.
1		0110	15	0.	*	1		0725	90	139.	*	1		1340	165	17.	*	1		1955	240	1.
1		0115	16	0.	*	1		0730	91	131.	*	1		1345	166	17.	*	1		2000	241	1.
1		0120	17	0.	*	1		0735	92	122.	*	1		1350	167	17.	*	1		2005	242	1.
1		0125	18	0.	*	1		0740	93	115.	*	1		1355	168	16.	*	1		2010	243	1.
1		0130	19	0.	*	1		0745	94	108.	*	1		1400	169	16.	*	1		2015	244	1.
1		0135	20	0.	*	1		0750	95	102.	*	1		1405	170	15.	*	1		2020	245	1.
1		0140	21	0.	*	1		0755	96	97.	*	1		1410	171	15.	*	1		2025	246	1.
1		0145	22	0.	*	1		0800	97	96.	*	1		1415	172	14.	*	1		2030	247	1.
1		0150	23	0.	*	1		0805	98	101.	*	1		1420	173	14.	*	1		2035	248	1.
1		0155	24	0.	*	1		0810	99	115.	*	1		1425	174	14.	*	1		2040	249	1.
1		0200	25	0.	*	1		0815	100	130.	*	1		1430	175	13.	*	1		2045	250	1.
1		0205	26	0.	*	1		0820	101	129.	*	1		1435	176	13.	*	1		2050	251	1.
1		0210	27	0.	*	1		0825	102	118.	*	1		1440	177	12.	*	1		2055	252	1.
1		0215	28	0.	*	1		0830	103	113.	*	1		1445	178	12.	*	1		2100	253	1.
1		0220	29	0.	*	1		0835	104	112.	*	1		1450	179	12.	*	1		2105	254	1.
1		0225	30	0.	*	1		0840	105	108.	*	1		1455	180	11.	*	1		2110	255	1.

1	0230	31	0.	*	1	0845	106	103.	*	1	1500	181	11.	*	1	2115	256	1.
1	0235	32	0.	*	1	0850	107	103.	*	1	1505	182	11.	*	1	2120	257	1.
1	0240	33	0.	*	1	0855	108	103.	*	1	1510	183	10.	*	1	2125	258	1.
1	0245	34	0.	*	1	0900	109	105.	*	1	1515	184	10.	*	1	2130	259	1.
1	0250	35	0.	*	1	0905	110	109.	*	1	1520	185	10.	*	1	2135	260	1.
1	0255	36	0.	*	1	0910	111	108.	*	1	1525	186	9.	*	1	2140	261	1.
1	0300	37	0.	*	1	0915	112	102.	*	1	1530	187	9.	*	1	2145	262	0.
1	0305	38	0.	*	1	0920	113	98.	*	1	1535	188	9.	*	1	2150	263	0.
1	0310	39	0.	*	1	0925	114	95.	*	1	1540	189	8.	*	1	2155	264	0.
1	0315	40	0.	*	1	0930	115	94.	*	1	1545	190	8.	*	1	2200	265	0.
1	0320	41	0.	*	1	0935	116	93.	*	1	1550	191	8.	*	1	2205	266	0.
1	0325	42	0.	*	1	0940	117	88.	*	1	1555	192	8.	*	1	2210	267	0.
1	0330	43	0.	*	1	0945	118	83.	*	1	1600	193	7.	*	1	2215	268	0.
1	0335	44	0.	*	1	0950	119	80.	*	1	1605	194	7.	*	1	2220	269	0.
1	0340	45	0.	*	1	0955	120	78.	*	1	1610	195	7.	*	1	2225	270	0.
1	0345	46	0.	*	1	1000	121	76.	*	1	1615	196	7.	*	1	2230	271	0.
1	0350	47	0.	*	1	1005	122	73.	*	1	1620	197	6.	*	1	2235	272	0.
1	0355	48	1.	*	1	1010	123	69.	*	1	1625	198	6.	*	1	2240	273	0.
1	0400	49	3.	*	1	1015	124	66.	*	1	1630	199	6.	*	1	2245	274	0.
1	0405	50	7.	*	1	1020	125	64.	*	1	1635	200	6.	*	1	2250	275	0.
1	0410	51	12.	*	1	1025	126	63.	*	1	1640	201	5.	*	1	2255	276	0.
1	0415	52	19.	*	1	1030	127	62.	*	1	1645	202	5.	*	1	2300	277	0.
1	0420	53	31.	*	1	1035	128	59.	*	1	1650	203	5.	*	1	2305	278	0.
1	0425	54	45.	*	1	1040	129	57.	*	1	1655	204	5.	*	1	2310	279	0.
1	0430	55	61.	*	1	1045	130	57.	*	1	1700	205	5.	*	1	2315	280	0.
1	0435	56	79.	*	1	1050	131	56.	*	1	1705	206	4.	*	1	2320	281	0.
1	0440	57	95.	*	1	1055	132	54.	*	1	1710	207	4.	*	1	2325	282	0.
1	0445	58	103.	*	1	1100	133	51.	*	1	1715	208	4.	*	1	2330	283	0.
1	0450	59	112.	*	1	1105	134	49.	*	1	1720	209	4.	*	1	2335	284	0.
1	0455	60	119.	*	1	1110	135	48.	*	1	1725	210	4.	*	1	2340	285	0.
1	0500	61	126.	*	1	1115	136	46.	*	1	1730	211	4.	*	1	2345	286	0.
1	0505	62	136.	*	1	1120	137	44.	*	1	1735	212	4.	*	1	2350	287	0.
1	0510	63	149.	*	1	1125	138	43.	*	1	1740	213	3.	*	1	2355	288	0.
1	0515	64	165.	*	1	1130	139	42.	*	1	1745	214	3.	*	2	0000	289	0.
1	0520	65	184.	*	1	1135	140	40.	*	1	1750	215	3.	*	2	0005	290	0.
1	0525	66	210.	*	1	1140	141	39.	*	1	1755	216	3.	*	2	0010	291	0.
1	0530	67	244.	*	1	1145	142	37.	*	1	1800	217	3.	*	2	0015	292	0.
1	0535	68	274.	*	1	1150	143	36.	*	1	1805	218	3.	*	2	0020	293	0.
1	0540	69	282.	*	1	1155	144	35.	*	1	1810	219	3.	*	2	0025	294	0.
1	0545	70	279.	*	1	1200	145	34.	*	1	1815	220	3.	*	2	0030	295	0.
1	0550	71	285.	*	1	1205	146	32.	*	1	1820	221	2.	*	2	0035	296	0.
1	0555	72	286.	*	1	1210	147	31.	*	1	1825	222	2.	*	2	0040	297	0.
1	0600	73	275.	*	1	1215	148	30.	*	1	1830	223	2.	*	2	0045	298	0.
1	0605	74	269.	*	1	1220	149	29.	*	1	1835	224	2.	*	2	0050	299	0.
1	0610	75	262.	*	1	1225	150	28.	*	1	1840	225	2.	*	2	0055	300	0.
				*					*					*				

****

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)	(CFS)				
+ 286.	5.92		148.	44.	42.	42.
		(INCHES)	.015	.018	.018	.018
		(AC-FT)	73.	87.	87.	87.

CUMULATIVE AREA = 88.86 SQ MI

```
1****************************************                                                    ****************************************
 *                                      *                                                    *                                      *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *                                                    *    U.S. ARMY CORPS OF ENGINEERS      *
 *               JUN   1998             *                                                    *    HYDROLOGIC ENGINEERING CENTER     *
 *            VERSION 4.1               *                                                    *          609 SECOND STREET           *
 *                                      *                                                    *       DAVIS, CALIFORNIA 95616        *
 *  RUN DATE   05JAN09  TIME  14:28:18  *                                                    *           (916) 756-1104             *
 *                                      *                                                    *                                      *
 ****************************************                                                    ****************************************
```

```
X     X  XXXXXXX   XXXXX           X
X     X  X        X     X         XX
X     X  X        X                X
XXXXXXX  XXXX     X        XXXXX   X
X     X  X        X                X
X     X  X        X     X          X
X     X  XXXXXXX   XXXXX          XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

```
1                                                   HEC-1 INPUT                                                PAGE  1

          LINE           ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 *** FREE ***
 *** NOLIST ***
1****************************************                                                    ****************************************
 *                                      *                                                    *                                      *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *                                                    *    U.S. ARMY CORPS OF ENGINEERS      *
 *               JUN   1998             *                                                    *    HYDROLOGIC ENGINEERING CENTER     *
 *            VERSION 4.1               *                                                    *          609 SECOND STREET           *
 *                                      *                                                    *       DAVIS, CALIFORNIA 95616        *
 *  RUN DATE   05JAN09  TIME  14:28:18  *                                                    *           (916) 756-1104             *
 *                                      *                                                    *                                      *
 ****************************************                                                    ****************************************
```

KLEINFELDER
FEBRUARY 2008
ALTERNATIVE B

DESIGN STORM = 100-YEAR 6-HOUR STORM
STORM DISTRIBUTION = SDN5

```
  10 IO          OUTPUT CONTROL VARIABLES
                       IPRNT           5  PRINT CONTROL
                       IPLOT           0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE

     IT          HYDROGRAPH TIME DATA
                        NMIN           5  MINUTES IN COMPUTATION INTERVAL
                       IDATE      1    0  STARTING DATE
                       ITIME        0000  STARTING TIME
                          NQ         300  NUMBER OF HYDROGRAPH ORDINATES
                      NDDATE      2    0  ENDING DATE
                      NDTIME        0055  ENDING TIME
                      ICENT           19  CENTURY MARK

                  COMPUTATION INTERVAL     .08 HOURS
                       TOTAL TIME BASE   24.92 HOURS

          ENGLISH UNITS
```

```
              DRAINAGE AREA         SQUARE MILES
              PRECIPITATION DEPTH   INCHES
              LENGTH, ELEVATION     FEET
              FLOW                  CUBIC FEET PER SECOND
              STORAGE VOLUME        ACRE-FEET
              SURFACE AREA          ACRES
              TEMPERATURE           DEGREES FAHRENHEIT

     JP          MULTI-PLAN OPTION
                       NPLAN           1  NUMBER OF PLANS

     JR          MULTI-RATIO OPTION
                     RATIOS OF PRECIPITATION
                    1.00       .87       .74       .57       .44       .26


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


            **************
            *            *
1250 KK     *     ULWIN  *
            *            *
            **************

1254 KO          OUTPUT CONTROL VARIABLES
                       IPRNT           1  PRINT CONTROL
                       IPLOT           0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE

1253 HC          HYDROGRAPH COMBINATION
                       ICOMP           4  NUMBER OF HYDROGRAPHS TO COMBINE

                                                                  ***
*****************************************************************************************************************************

                                                HYDROGRAPH AT STATION    ULWIN
                                                     SUM OF  4 HYDROGRAPHS
                                                   PLAN 1,   RATIO =  1.00
*****************************************************************************************************************************
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DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	8250.	1		1230	151	5.	1		1845	226	0.
1		0005	2	0.	1		0620	77	7575.	1		1235	152	4.	1		1850	227	0.
1		0010	3	0.	1		0625	78	6943.	1		1240	153	4.	1		1855	228	0.
1		0015	4	0.	1		0630	79	6357.	1		1245	154	3.	1		1900	229	0.
1		0020	5	0.	1		0635	80	5826.	1		1250	155	3.	1		1905	230	0.
1		0025	6	0.	1		0640	81	5346.	1		1255	156	2.	1		1910	231	0.
1		0030	7	0.	1		0645	82	4909.	1		1300	157	2.	1		1915	232	0.
1		0035	8	0.	1		0650	83	4510.	1		1305	158	2.	1		1920	233	0.
1		0040	9	0.	1		0655	84	4147.	1		1310	159	1.	1		1925	234	0.
1		0045	10	0.	1		0700	85	3815.	1		1315	160	1.	1		1930	235	0.
1		0050	11	1.	1		0705	86	3507.	1		1320	161	1.	1		1935	236	0.
1		0055	12	2.	1		0710	87	3223.	1		1325	162	1.	1		1940	237	0.
1		0100	13	4.	1		0715	88	2959.	1		1330	163	1.	1		1945	238	0.
1		0105	14	6.	1		0720	89	2716.	1		1335	164	1.	1		1950	239	0.
1		0110	15	9.	1		0725	90	2491.	1		1340	165	1.	1		1955	240	0.
1		0115	16	12.	1		0730	91	2285.	1		1345	166	1.	1		2000	241	0.
1		0120	17	16.	1		0735	92	2095.	1		1350	167	0.	1		2005	242	0.
1		0125	18	20.	1		0740	93	1922.	1		1355	168	0.	1		2010	243	0.
1		0130	19	25.	1		0745	94	1763.	1		1400	169	0.	1		2015	244	0.
1		0135	20	31.	1		0750	95	1618.	1		1405	170	0.	1		2020	245	0.
1		0140	21	38.	1		0755	96	1485.	1		1410	171	0.	1		2025	246	0.
1		0145	22	46.	1		0800	97	1364.	1		1415	172	0.	1		2030	247	0.
1		0150	23	55.	1		0805	98	1255.	1		1420	173	0.	1		2035	248	0.
1		0155	24	65.	1		0810	99	1156.	1		1425	174	0.	1		2040	249	0.
1		0200	25	77.	1		0815	100	1065.	1		1430	175	0.	1		2045	250	0.
1		0205	26	93.	1		0820	101	979.	1		1435	176	0.	1		2050	251	0.
1		0210	27	112.	1		0825	102	896.	1		1440	177	0.	1		2055	252	0.
1		0215	28	137.	1		0830	103	818.	1		1445	178	0.	1		2100	253	0.
1		0220	29	166.	1		0835	104	746.	1		1450	179	0.	1		2105	254	0.
1		0225	30	200.	1		0840	105	678.	1		1455	180	0.	1		2110	255	0.
1		0230	31	237.	1		0845	106	615.	1		1500	181	0.	1		2115	256	0.
1		0235	32	275.	1		0850	107	558.	1		1505	182	0.	1		2120	257	0.
1		0240	33	313.	1		0855	108	505.	1		1510	183	0.	1		2125	258	0.
1		0245	34	351.	1		0900	109	457.	1		1515	184	0.	1		2130	259	0.
1		0250	35	387.	1		0905	110	414.	1		1520	185	0.	1		2135	260	0.

1	0255	36	426.	*	1	0910	111	375.	*	1	1525	186	0.	*	1	2140	261	0.
1	0300	37	470.	*	1	0915	112	341.	*	1	1530	187	0.	*	1	2145	262	0.
1	0305	38	525.	*	1	0920	113	309.	*	1	1535	188	0.	*	1	2150	263	0.
1	0310	39	599.	*	1	0925	114	281.	*	1	1540	189	0.	*	1	2155	264	0.
1	0315	40	696.	*	1	0930	115	255.	*	1	1545	190	0.	*	1	2200	265	0.
1	0320	41	826.	*	1	0935	116	231.	*	1	1550	191	0.	*	1	2205	266	0.
1	0325	42	1000.	*	1	0940	117	210.	*	1	1555	192	0.	*	1	2210	267	0.
1	0330	43	1235.	*	1	0945	118	190.	*	1	1600	193	0.	*	1	2215	268	0.
1	0335	44	1555.	*	1	0950	119	172.	*	1	1605	194	0.	*	1	2220	269	0.
1	0340	45	1975.	*	1	0955	120	155.	*	1	1610	195	0.	*	1	2225	270	0.
1	0345	46	2477.	*	1	1000	121	140.	*	1	1615	196	0.	*	1	2230	271	0.
1	0350	47	3021.	*	1	1005	122	126.	*	1	1620	197	0.	*	1	2235	272	0.
1	0355	48	3559.	*	1	1010	123	114.	*	1	1625	198	0.	*	1	2240	273	0.
1	0400	49	4096.	*	1	1015	124	103.	*	1	1630	199	0.	*	1	2245	274	0.
1	0405	50	4917.	*	1	1020	125	92.	*	1	1635	200	0.	*	1	2250	275	0.
1	0410	51	6451.	*	1	1025	126	83.	*	1	1640	201	0.	*	1	2255	276	0.
1	0415	52	8595.	*	1	1030	127	75.	*	1	1645	202	0.	*	1	2300	277	0.
1	0420	53	10813.	*	1	1035	128	67.	*	1	1650	203	0.	*	1	2305	278	0.
1	0425	54	12706.	*	1	1040	129	60.	*	1	1655	204	0.	*	1	2310	279	0.
1	0430	55	14049.	*	1	1045	130	54.	*	1	1700	205	0.	*	1	2315	280	0.
1	0435	56	14729.	*	1	1050	131	49.	*	1	1705	206	0.	*	1	2320	281	0.
1	0440	57	14835.	*	1	1055	132	43.	*	1	1710	207	0.	*	1	2325	282	0.
1	0445	58	14555.	*	1	1100	133	39.	*	1	1715	208	0.	*	1	2330	283	0.
1	0450	59	14028.	*	1	1105	134	35.	*	1	1720	209	0.	*	1	2335	284	0.
1	0455	60	13424.	*	1	1110	135	31.	*	1	1725	210	0.	*	1	2340	285	0.
1	0500	61	12906.	*	1	1115	136	28.	*	1	1730	211	0.	*	1	2345	286	0.
1	0505	62	12498.	*	1	1120	137	25.	*	1	1735	212	0.	*	1	2350	287	0.
1	0510	63	12193.	*	1	1125	138	22.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	12003.	*	1	1130	139	20.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	11901.	*	1	1135	140	18.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	11858.	*	1	1140	141	16.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	11864.	*	1	1145	142	14.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	11877.	*	1	1150	143	12.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	11826.	*	1	1155	144	11.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	11664.	*	1	1200	145	10.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	11358.	*	1	1205	146	9.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	10891.	*	1	1210	147	8.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	10305.	*	1	1215	148	7.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	9650.	*	1	1220	149	6.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	8953.	*	1	1225	150	5.	*	1	1840	225	0.	*	2	0055	300	0.

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 14835.	4.67		5795.	1476.	1422.	1422.
		(INCHES)	.916	.933	.933	.933
		(AC-FT)	2874.	2928.	2928.	2928.

CUMULATIVE AREA = 58.84 SQ MI

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HYDROGRAPH AT STATION ULWIN
SUM OF 4 HYDROGRAPHS
PLAN 1, RATIO = .87

****

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	6853.	1		1230	151	7.	1		1845	226	0.
1		0005	2	0.	1		0620	77	6339.	1		1235	152	6.	1		1850	227	0.
1		0010	3	0.	1		0625	78	5841.	1		1240	153	5.	1		1855	228	0.
1		0015	4	0.	1		0630	79	5373.	1		1245	154	5.	1		1900	229	0.
1		0020	5	0.	1		0635	80	4938.	1		1250	155	4.	1		1905	230	0.
1		0025	6	0.	1		0640	81	4537.	1		1255	156	4.	1		1910	231	0.
1		0030	7	0.	1		0645	82	4171.	1		1300	157	3.	1		1915	232	0.
1		0035	8	0.	1		0650	83	3837.	1		1305	158	3.	1		1920	233	0.
1		0040	9	0.	1		0655	84	3534.	1		1310	159	2.	1		1925	234	0.
1		0045	10	0.	1		0700	85	3258.	1		1315	160	2.	1		1930	235	0.
1		0050	11	0.	1		0705	86	3006.	1		1320	161	2.	1		1935	236	0.
1		0055	12	0.	1		0710	87	2771.	1		1325	162	2.	1		1940	237	0.
1		0100	13	0.	1		0715	88	2554.	1		1330	163	1.	1		1945	238	0.
1		0105	14	1.	1		0720	89	2354.	1		1335	164	1.	1		1950	239	0.
1		0110	15	1.	1		0725	90	2169.	1		1340	165	1.	1		1955	240	0.
1		0115	16	2.	1		0730	91	1997.	1		1345	166	1.	1		2000	241	0.
1		0120	17	3.	1		0735	92	1838.	1		1350	167	1.	1		2005	242	0.

1	0125	18	4.	*	1	0740	93	1693.	*	1	1355	168	1.	*	1	2010	243	0.
1	0130	19	6.	*	1	0745	94	1559.	*	1	1400	169	1.	*	1	2015	244	0.
1	0135	20	8.	*	1	0750	95	1437.	*	1	1405	170	1.	*	1	2020	245	0.
1	0140	21	11.	*	1	0755	96	1326.	*	1	1410	171	0.	*	1	2025	246	0.
1	0145	22	15.	*	1	0800	97	1225.	*	1	1415	172	0.	*	1	2030	247	0.
1	0150	23	19.	*	1	0805	98	1132.	*	1	1420	173	0.	*	1	2035	248	0.
1	0155	24	25.	*	1	0810	99	1046.	*	1	1425	174	0.	*	1	2040	249	0.
1	0200	25	32.	*	1	0815	100	965.	*	1	1430	175	0.	*	1	2045	250	0.
1	0205	26	41.	*	1	0820	101	887.	*	1	1435	176	0.	*	1	2050	251	0.
1	0210	27	52.	*	1	0825	102	816.	*	1	1440	177	0.	*	1	2055	252	0.
1	0215	28	65.	*	1	0830	103	751.	*	1	1445	178	0.	*	1	2100	253	0.
1	0220	29	79.	*	1	0835	104	692.	*	1	1450	179	0.	*	1	2105	254	0.
1	0225	30	95.	*	1	0840	105	636.	*	1	1455	180	0.	*	1	2110	255	0.
1	0230	31	113.	*	1	0845	106	583.	*	1	1500	181	0.	*	1	2115	256	0.
1	0235	32	131.	*	1	0850	107	532.	*	1	1505	182	0.	*	1	2120	257	0.
1	0240	33	150.	*	1	0855	108	484.	*	1	1510	183	0.	*	1	2125	258	0.
1	0245	34	170.	*	1	0900	109	440.	*	1	1515	184	0.	*	1	2130	259	0.
1	0250	35	190.	*	1	0905	110	399.	*	1	1520	185	0.	*	1	2135	260	0.
1	0255	36	209.	*	1	0910	111	362.	*	1	1525	186	0.	*	1	2140	261	0.
1	0300	37	228.	*	1	0915	112	328.	*	1	1530	187	0.	*	1	2145	262	0.
1	0305	38	251.	*	1	0920	113	298.	*	1	1535	188	0.	*	1	2150	263	0.
1	0310	39	284.	*	1	0925	114	271.	*	1	1540	189	0.	*	1	2155	264	0.
1	0315	40	333.	*	1	0930	115	246.	*	1	1545	190	0.	*	1	2200	265	0.
1	0320	41	407.	*	1	0935	116	225.	*	1	1550	191	0.	*	1	2205	266	0.
1	0325	42	514.	*	1	0940	117	205.	*	1	1555	192	0.	*	1	2210	267	0.
1	0330	43	667.	*	1	0945	118	188.	*	1	1600	193	0.	*	1	2215	268	0.
1	0335	44	887.	*	1	0950	119	171.	*	1	1605	194	0.	*	1	2220	269	0.
1	0340	45	1192.	*	1	0955	120	157.	*	1	1610	195	0.	*	1	2225	270	0.
1	0345	46	1570.	*	1	1000	121	144.	*	1	1615	196	0.	*	1	2230	271	0.
1	0350	47	1989.	*	1	1005	122	131.	*	1	1620	197	0.	*	1	2235	272	0.
1	0355	48	2412.	*	1	1010	123	120.	*	1	1625	198	0.	*	1	2240	273	0.
1	0400	49	2789.	*	1	1015	124	110.	*	1	1630	199	0.	*	1	2245	274	0.
1	0405	50	3107.	*	1	1020	125	101.	*	1	1635	200	0.	*	1	2250	275	0.
1	0410	51	3407.	*	1	1025	126	92.	*	1	1640	201	0.	*	1	2255	276	0.
1	0415	52	4246.	*	1	1030	127	84.	*	1	1645	202	0.	*	1	2300	277	0.
1	0420	53	5902.	*	1	1035	128	77.	*	1	1650	203	0.	*	1	2305	278	0.
1	0425	54	7511.	*	1	1040	129	70.	*	1	1655	204	0.	*	1	2310	279	0.
1	0430	55	8747.	*	1	1045	130	64.	*	1	1700	205	0.	*	1	2315	280	0.
1	0435	56	9727.	*	1	1050	131	58.	*	1	1705	206	0.	*	1	2320	281	0.
1	0440	57	10371.	*	1	1055	132	53.	*	1	1710	207	0.	*	1	2325	282	0.
1	0445	58	10656.	*	1	1100	133	48.	*	1	1715	208	0.	*	1	2330	283	0.
1	0450	59	10629.	*	1	1105	134	43.	*	1	1720	209	0.	*	1	2335	284	0.
1	0455	60	10384.	*	1	1110	135	39.	*	1	1725	210	0.	*	1	2340	285	0.
1	0500	61	10056.	*	1	1115	136	35.	*	1	1730	211	0.	*	1	2345	286	0.
1	0505	62	9742.	*	1	1120	137	31.	*	1	1735	212	0.	*	1	2350	287	0.
1	0510	63	9499.	*	1	1125	138	28.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	9334.	*	1	1130	139	25.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	9239.	*	1	1135	140	23.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	9196.	*	1	1140	141	20.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	9187.	*	1	1145	142	18.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	9194.	*	1	1150	143	16.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	9182.	*	1	1155	144	15.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	9110.	*	1	1200	145	13.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	8950.	*	1	1205	146	12.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	8684.	*	1	1210	147	10.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	8319.	*	1	1215	148	9.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	7869.	*	1	1220	149	8.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	7370.	*	1	1225	150	7.	*	1	1840	225	0.	*	2	0055	300	0.

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PEAK FLOW (CFS)	TIME (HR)	MAXIMUM AVERAGE FLOW (CFS)	6-HR	24-HR	72-HR	24.92-HR
+ 10656.	4.75		4371.	1113.	1072.	1072.
		(INCHES)	.691	.704	.704	.704
		(AC-FT)	2167.	2208.	2208.	2208.

CUMULATIVE AREA = 58.84 SQ MI

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HYDROGRAPH AT STATION ULWIN
SUM OF 4 HYDROGRAPHS
PLAN 1, RATIO = .74

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DA MON HRMN	ORD	FLOW	*	DA MON HRMN	ORD	FLOW	*	DA MON HRMN	ORD	FLOW	*	DA MON HRMN	ORD	FLOW

1	0000	1	0.	*	1	0615	76	5375.	*	1	1230	151	10.	*	1	1845	226	0.
1	0005	2	0.	*	1	0620	77	5022.	*	1	1235	152	9.	*	1	1850	227	0.
1	0010	3	0.	*	1	0625	78	4672.	*	1	1240	153	8.	*	1	1855	228	0.
1	0015	4	0.	*	1	0630	79	4330.	*	1	1245	154	7.	*	1	1900	229	0.
1	0020	5	0.	*	1	0635	80	4003.	*	1	1250	155	7.	*	1	1905	230	0.
1	0025	6	0.	*	1	0640	81	3695.	*	1	1255	156	6.	*	1	1910	231	0.
1	0030	7	0.	*	1	0645	82	3409.	*	1	1300	157	5.	*	1	1915	232	0.
1	0035	8	0.	*	1	0650	83	3146.	*	1	1305	158	5.	*	1	1920	233	0.
1	0040	9	0.	*	1	0655	84	2904.	*	1	1310	159	4.	*	1	1925	234	0.
1	0045	10	0.	*	1	0700	85	2683.	*	1	1315	160	4.	*	1	1930	235	0.
1	0050	11	0.	*	1	0705	86	2479.	*	1	1320	161	3.	*	1	1935	236	0.
1	0055	12	0.	*	1	0710	87	2293.	*	1	1325	162	3.	*	1	1940	237	0.
1	0100	13	0.	*	1	0715	88	2121.	*	1	1330	163	3.	*	1	1945	238	0.
1	0105	14	0.	*	1	0720	89	1962.	*	1	1335	164	2.	*	1	1950	239	0.
1	0110	15	0.	*	1	0725	90	1815.	*	1	1340	165	2.	*	1	1955	240	0.
1	0115	16	0.	*	1	0730	91	1679.	*	1	1345	166	2.	*	1	2000	241	0.
1	0120	17	0.	*	1	0735	92	1554.	*	1	1350	167	2.	*	1	2005	242	0.
1	0125	18	0.	*	1	0740	93	1439.	*	1	1355	168	1.	*	1	2010	243	0.
1	0130	19	0.	*	1	0745	94	1333.	*	1	1400	169	1.	*	1	2015	244	0.
1	0135	20	1.	*	1	0750	95	1233.	*	1	1405	170	1.	*	1	2020	245	0.
1	0140	21	1.	*	1	0755	96	1142.	*	1	1410	171	1.	*	1	2025	246	0.
1	0145	22	2.	*	1	0800	97	1057.	*	1	1415	172	1.	*	1	2030	247	0.
1	0150	23	4.	*	1	0805	98	979.	*	1	1420	173	1.	*	1	2035	248	0.
1	0155	24	6.	*	1	0810	99	908.	*	1	1425	174	1.	*	1	2040	249	0.
1	0200	25	9.	*	1	0815	100	842.	*	1	1430	175	1.	*	1	2045	250	0.
1	0205	26	12.	*	1	0820	101	782.	*	1	1435	176	1.	*	1	2050	251	0.
1	0210	27	17.	*	1	0825	102	726.	*	1	1440	177	0.	*	1	2055	252	0.
1	0215	28	22.	*	1	0830	103	675.	*	1	1445	178	0.	*	1	2100	253	0.
1	0220	29	29.	*	1	0835	104	629.	*	1	1450	179	0.	*	1	2105	254	0.
1	0225	30	38.	*	1	0840	105	586.	*	1	1455	180	0.	*	1	2110	255	0.
1	0230	31	47.	*	1	0845	106	546.	*	1	1500	181	0.	*	1	2115	256	0.
1	0235	32	56.	*	1	0850	107	508.	*	1	1505	182	0.	*	1	2120	257	0.
1	0240	33	66.	*	1	0855	108	472.	*	1	1510	183	0.	*	1	2125	258	0.
1	0245	34	74.	*	1	0900	109	439.	*	1	1515	184	0.	*	1	2130	259	0.
1	0250	35	82.	*	1	0905	110	409.	*	1	1520	185	0.	*	1	2135	260	0.
1	0255	36	90.	*	1	0910	111	381.	*	1	1525	186	0.	*	1	2140	261	0.
1	0300	37	98.	*	1	0915	112	352.	*	1	1530	187	0.	*	1	2145	262	0.
1	0305	38	107.	*	1	0920	113	323.	*	1	1535	188	0.	*	1	2150	263	0.
1	0310	39	118.	*	1	0925	114	296.	*	1	1540	189	0.	*	1	2155	264	0.
1	0315	40	135.	*	1	0930	115	271.	*	1	1545	190	0.	*	1	2200	265	0.
1	0320	41	160.	*	1	0935	116	248.	*	1	1550	191	0.	*	1	2205	266	0.
1	0325	42	203.	*	1	0940	117	227.	*	1	1555	192	0.	*	1	2210	267	0.
1	0330	43	269.	*	1	0945	118	208.	*	1	1600	193	0.	*	1	2215	268	0.
1	0335	44	371.	*	1	0950	119	191.	*	1	1605	194	0.	*	1	2220	269	0.
1	0340	45	534.	*	1	0955	120	175.	*	1	1610	195	0.	*	1	2225	270	0.
1	0345	46	771.	*	1	1000	121	160.	*	1	1615	196	0.	*	1	2230	271	0.
1	0350	47	1065.	*	1	1005	122	147.	*	1	1620	197	0.	*	1	2235	272	0.
1	0355	48	1384.	*	1	1010	123	135.	*	1	1625	198	0.	*	1	2240	273	0.
1	0400	49	1682.	*	1	1015	124	124.	*	1	1630	199	0.	*	1	2245	274	0.
1	0405	50	1913.	*	1	1020	125	114.	*	1	1635	200	0.	*	1	2250	275	0.
1	0410	51	2066.	*	1	1025	126	105.	*	1	1640	201	0.	*	1	2255	276	0.
1	0415	52	2154.	*	1	1030	127	97.	*	1	1645	202	0.	*	1	2300	277	0.
1	0420	53	2252.	*	1	1035	128	89.	*	1	1650	203	0.	*	1	2305	278	0.
1	0425	54	2913.	*	1	1040	129	82.	*	1	1655	204	0.	*	1	2310	279	0.
1	0430	55	4425.	*	1	1045	130	75.	*	1	1700	205	0.	*	1	2315	280	0.
1	0435	56	5389.	*	1	1050	131	69.	*	1	1705	206	0.	*	1	2320	281	0.
1	0440	57	5835.	*	1	1055	132	63.	*	1	1710	207	0.	*	1	2325	282	0.
1	0445	58	6383.	*	1	1100	133	57.	*	1	1715	208	0.	*	1	2330	283	0.
1	0450	59	6807.	*	1	1105	134	52.	*	1	1720	209	0.	*	1	2335	284	0.
1	0455	60	7050.	*	1	1110	135	48.	*	1	1725	210	0.	*	1	2340	285	0.
1	0500	61	7115.	*	1	1115	136	43.	*	1	1730	211	0.	*	1	2345	286	0.
1	0505	62	7054.	*	1	1120	137	40.	*	1	1735	212	0.	*	1	2350	287	0.
1	0510	63	6917.	*	1	1125	138	36.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	6780.	*	1	1130	139	33.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	6683.	*	1	1135	140	30.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	6628.	*	1	1140	141	27.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	6600.	*	1	1145	142	24.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	6594.	*	1	1150	143	22.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	6592.	*	1	1155	144	20.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	6588.	*	1	1200	145	18.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	6545.	*	1	1205	146	17.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	6436.	*	1	1210	147	15.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	6258.	*	1	1215	148	14.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	6011.	*	1	1220	149	12.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	5711.	*	1	1225	150	11.	*	1	1840	225	0.	*	2	0055	300	0.

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PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.92-HR

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+   (CFS)       (HR)
                          (CFS)
+    7115.      5.00                 3069.        783.        754.         754.
                         (INCHES)      .485        .495        .495         .495
                          (AC-FT)     1522.       1553.       1553.        1553.

                         CUMULATIVE AREA =   58.84 SQ MI
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HYDROGRAPH AT STATION ULWIN
SUM OF 4 HYDROGRAPHS
PLAN 1, RATIO = .57

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DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	3219.	1		1230	151	15.	1		1845	226	0.
1		0005	2	0.	1		0620	77	3097.	1		1235	152	14.	1		1850	227	0.
1		0010	3	0.	1		0625	78	2965.	1		1240	153	13.	1		1855	228	0.
1		0015	4	0.	1		0630	79	2826.	1		1245	154	12.	1		1900	229	0.
1		0020	5	0.	1		0635	80	2674.	1		1250	155	11.	1		1905	230	0.
1		0025	6	0.	1		0640	81	2516.	1		1255	156	10.	1		1910	231	0.
1		0030	7	0.	1		0645	82	2354.	1		1300	157	9.	1		1915	232	0.
1		0035	8	0.	1		0650	83	2193.	1		1305	158	8.	1		1920	233	0.
1		0040	9	0.	1		0655	84	2038.	1		1310	159	8.	1		1925	234	0.
1		0045	10	0.	1		0700	85	1892.	1		1315	160	7.	1		1930	235	0.
1		0050	11	0.	1		0705	86	1756.	1		1320	161	7.	1		1935	236	0.
1		0055	12	0.	1		0710	87	1633.	1		1325	162	6.	1		1940	237	0.
1		0100	13	0.	1		0715	88	1519.	1		1330	163	6.	1		1945	238	0.
1		0105	14	0.	1		0720	89	1413.	1		1335	164	5.	1		1950	239	0.
1		0110	15	0.	1		0725	90	1315.	1		1340	165	5.	1		1955	240	0.
1		0115	16	0.	1		0730	91	1221.	1		1345	166	4.	1		2000	241	0.
1		0120	17	0.	1		0735	92	1135.	1		1350	167	4.	1		2005	242	0.
1		0125	18	0.	1		0740	93	1055.	1		1355	168	4.	1		2010	243	0.
1		0130	19	0.	1		0745	94	983.	1		1400	169	3.	1		2015	244	0.
1		0135	20	0.	1		0750	95	917.	1		1405	170	3.	1		2020	245	0.
1		0140	21	0.	1		0755	96	856.	1		1410	171	3.	1		2025	246	0.
1		0145	22	0.	1		0800	97	798.	1		1415	172	2.	1		2030	247	0.
1		0150	23	0.	1		0805	98	745.	1		1420	173	2.	1		2035	248	0.
1		0155	24	0.	1		0810	99	697.	1		1425	174	2.	1		2040	249	0.
1		0200	25	0.	1		0815	100	652.	1		1430	175	2.	1		2045	250	0.
1		0205	26	0.	1		0820	101	610.	1		1435	176	2.	1		2050	251	0.
1		0210	27	1.	1		0825	102	572.	1		1440	177	1.	1		2055	252	0.
1		0215	28	2.	1		0830	103	536.	1		1445	178	1.	1		2100	253	0.
1		0220	29	3.	1		0835	104	501.	1		1450	179	1.	1		2105	254	0.
1		0225	30	4.	1		0840	105	470.	1		1455	180	1.	1		2110	255	0.
1		0230	31	6.	1		0845	106	440.	1		1500	181	1.	1		2115	256	0.
1		0235	32	8.	1		0850	107	413.	1		1505	182	1.	1		2120	257	0.
1		0240	33	11.	1		0855	108	387.	1		1510	183	1.	1		2125	258	0.
1		0245	34	13.	1		0900	109	362.	1		1515	184	1.	1		2130	259	0.
1		0250	35	15.	1		0905	110	339.	1		1520	185	1.	1		2135	260	0.
1		0255	36	18.	1		0910	111	317.	1		1525	186	1.	1		2140	261	0.
1		0300	37	20.	1		0915	112	296.	1		1530	187	0.	1		2145	262	0.
1		0305	38	23.	1		0920	113	277.	1		1535	188	0.	1		2150	263	0.
1		0310	39	28.	1		0925	114	258.	1		1540	189	0.	1		2155	264	0.
1		0315	40	34.	1		0930	115	242.	1		1545	190	0.	1		2200	265	0.
1		0320	41	43.	1		0935	116	226.	1		1550	191	0.	1		2205	266	0.
1		0325	42	58.	1		0940	117	211.	1		1555	192	0.	1		2210	267	0.
1		0330	43	82.	1		0945	118	196.	1		1600	193	0.	1		2215	268	0.
1		0335	44	116.	1		0950	119	182.	1		1605	194	0.	1		2220	269	0.
1		0340	45	166.	1		0955	120	169.	1		1610	195	0.	1		2225	270	0.
1		0345	46	230.	1		1000	121	156.	1		1615	196	0.	1		2230	271	0.
1		0350	47	309.	1		1005	122	144.	1		1620	197	0.	1		2235	272	0.
1		0355	48	454.	1		1010	123	133.	1		1625	198	0.	1		2240	273	0.
1		0400	49	645.	1		1015	124	123.	1		1630	199	0.	1		2245	274	0.
1		0405	50	818.	1		1020	125	114.	1		1635	200	0.	1		2250	275	0.
1		0410	51	947.	1		1025	126	105.	1		1640	201	0.	1		2255	276	0.
1		0415	52	1032.	1		1030	127	97.	1		1645	202	0.	1		2300	277	0.
1		0420	53	1069.	1		1035	128	90.	1		1650	203	0.	1		2305	278	0.
1		0425	54	1075.	1		1040	129	83.	1		1655	204	0.	1		2310	279	0.
1		0430	55	1061.	1		1045	130	77.	1		1700	205	0.	1		2315	280	0.
1		0435	56	1035.	1		1050	131	71.	1		1705	206	0.	1		2320	281	0.
1		0440	57	1022.	1		1055	132	66.	1		1710	207	0.	1		2325	282	0.
1		0445	58	1570.	1		1100	133	62.	1		1715	208	0.	1		2330	283	0.
1		0450	59	2548.	1		1105	134	57.	1		1720	209	0.	1		2335	284	0.
1		0455	60	2685.	1		1110	135	53.	1		1725	210	0.	1		2340	285	0.
1		0500	61	2825.	1		1115	136	50.	1		1730	211	0.	1		2345	286	0.
1		0505	62	2870.	1		1120	137	46.	1		1735	212	0.	1		2350	287	0.

1	0510	63	3139.	*	1	1125	138	43.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	3367.	*	1	1130	139	40.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	3538.	*	1	1135	140	37.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	3609.	*	1	1140	141	35.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	3607.	*	1	1145	142	32.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	3577.	*	1	1150	143	30.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	3513.	*	1	1155	144	27.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	3511.	*	1	1200	145	25.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	3545.	*	1	1205	146	23.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	3538.	*	1	1210	147	21.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	3493.	*	1	1215	148	20.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	3417.	*	1	1220	149	18.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	3322.	*	1	1225	150	17.	*	1	1840	225	0.	*	2	0055	300	0.

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PEAK FLOW (CFS)	TIME (HR)	MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
+		(CFS)			
+ 3609.	5.42	1615.	415.	400.	400.
		(INCHES) .255	.262	.262	.262
		(AC-FT) 801.	824.	824.	824.

CUMULATIVE AREA = 58.84 SQ MI

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HYDROGRAPH AT STATION ULWIN
SUM OF 4 HYDROGRAPHS
PLAN 1, RATIO = .44

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DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	1585.	1		1230	151	25.	1		1845	226	0.
1		0005	2	0.	1		0620	77	1523.	1		1235	152	23.	1		1850	227	0.
1		0010	3	0.	1		0625	78	1476.	1		1240	153	22.	1		1855	228	0.
1		0015	4	0.	1		0630	79	1406.	1		1245	154	21.	1		1900	229	0.
1		0020	5	0.	1		0635	80	1400.	1		1250	155	19.	1		1905	230	0.
1		0025	6	0.	1		0640	81	1344.	1		1255	156	18.	1		1910	231	0.
1		0030	7	0.	1		0645	82	1297.	1		1300	157	17.	1		1915	232	0.
1		0035	8	0.	1		0650	83	1267.	1		1305	158	16.	1		1920	233	0.
1		0040	9	0.	1		0655	84	1225.	1		1310	159	15.	1		1925	234	0.
1		0045	10	0.	1		0700	85	1178.	1		1315	160	14.	1		1930	235	0.
1		0050	11	0.	1		0705	86	1110.	1		1320	161	13.	1		1935	236	0.
1		0055	12	0.	1		0710	87	1061.	1		1325	162	12.	1		1940	237	0.
1		0100	13	0.	1		0715	88	1004.	1		1330	163	11.	1		1945	238	0.
1		0105	14	0.	1		0720	89	931.	1		1335	164	10.	1		1950	239	0.
1		0110	15	0.	1		0725	90	874.	1		1340	165	10.	1		1955	240	0.
1		0115	16	0.	1		0730	91	824.	1		1345	166	9.	1		2000	241	0.
1		0120	17	0.	1		0735	92	770.	1		1350	167	8.	1		2005	242	0.
1		0125	18	0.	1		0740	93	719.	1		1355	168	8.	1		2010	243	0.
1		0130	19	0.	1		0745	94	682.	1		1400	169	7.	1		2015	244	0.
1		0135	20	0.	1		0750	95	641.	1		1405	170	7.	1		2020	245	0.
1		0140	21	0.	1		0755	96	600.	1		1410	171	6.	1		2025	246	0.
1		0145	22	0.	1		0800	97	565.	1		1415	172	6.	1		2030	247	0.
1		0150	23	0.	1		0805	98	533.	1		1420	173	6.	1		2035	248	0.
1		0155	24	0.	1		0810	99	499.	1		1425	174	5.	1		2040	249	0.
1		0200	25	0.	1		0815	100	470.	1		1430	175	5.	1		2045	250	0.
1		0205	26	0.	1		0820	101	443.	1		1435	176	5.	1		2050	251	0.
1		0210	27	0.	1		0825	102	415.	1		1440	177	4.	1		2055	252	0.
1		0215	28	0.	1		0830	103	391.	1		1445	178	4.	1		2100	253	0.
1		0220	29	0.	1		0835	104	369.	1		1450	179	4.	1		2105	254	0.
1		0225	30	0.	1		0840	105	347.	1		1455	180	4.	1		2110	255	0.
1		0230	31	0.	1		0845	106	327.	1		1500	181	3.	1		2115	256	0.
1		0235	32	0.	1		0850	107	310.	1		1505	182	3.	1		2120	257	0.
1		0240	33	0.	1		0855	108	293.	1		1510	183	3.	1		2125	258	0.
1		0245	34	0.	1		0900	109	277.	1		1515	184	3.	1		2130	259	0.
1		0250	35	0.	1		0905	110	263.	1		1520	185	3.	1		2135	260	0.
1		0255	36	0.	1		0910	111	249.	1		1525	186	2.	1		2140	261	0.
1		0300	37	1.	1		0915	112	236.	1		1530	187	2.	1		2145	262	0.
1		0305	38	1.	1		0920	113	223.	1		1535	188	2.	1		2150	263	0.
1		0310	39	1.	1		0925	114	211.	1		1540	189	2.	1		2155	264	0.
1		0315	40	2.	1		0930	115	201.	1		1545	190	2.	1		2200	265	0.
1		0320	41	4.	1		0935	116	191.	1		1550	191	2.	1		2205	266	0.
1		0325	42	6.	1		0940	117	182.	1		1555	192	2.	1		2210	267	0.
1		0330	43	12.	1		0945	118	174.	1		1600	193	1.	1		2215	268	0.
1		0335	44	25.	1		0950	119	165.	1		1605	194	1.	1		2220	269	0.

1	0340	45	44.	*	1	0955	120	157.	*	1	1610	195	1.	*	1	2225	270	0.
1	0345	46	71.	*	1	1000	121	149.	*	1	1615	196	1.	*	1	2230	271	0.
1	0350	47	104.	*	1	1005	122	142.	*	1	1620	197	1.	*	1	2235	272	0.
1	0355	48	139.	*	1	1010	123	135.	*	1	1625	198	1.	*	1	2240	273	0.
1	0400	49	177.	*	1	1015	124	129.	*	1	1630	199	1.	*	1	2245	274	0.
1	0405	50	217.	*	1	1020	125	122.	*	1	1635	200	1.	*	1	2250	275	0.
1	0410	51	322.	*	1	1025	126	117.	*	1	1640	201	1.	*	1	2255	276	0.
1	0415	52	427.	*	1	1030	127	111.	*	1	1645	202	1.	*	1	2300	277	0.
1	0420	53	469.	*	1	1035	128	106.	*	1	1650	203	1.	*	1	2305	278	0.
1	0425	54	496.	*	1	1040	129	101.	*	1	1655	204	1.	*	1	2310	279	0.
1	0430	55	499.	*	1	1045	130	96.	*	1	1700	205	1.	*	1	2315	280	0.
1	0435	56	493.	*	1	1050	131	91.	*	1	1705	206	1.	*	1	2320	281	0.
1	0440	57	479.	*	1	1055	132	86.	*	1	1710	207	1.	*	1	2325	282	0.
1	0445	58	461.	*	1	1100	133	81.	*	1	1715	208	0.	*	1	2330	283	0.
1	0450	59	444.	*	1	1105	134	76.	*	1	1720	209	0.	*	1	2335	284	0.
1	0455	60	432.	*	1	1110	135	72.	*	1	1725	210	0.	*	1	2340	285	0.
1	0500	61	427.	*	1	1115	136	68.	*	1	1730	211	0.	*	1	2345	286	0.
1	0505	62	432.	*	1	1120	137	63.	*	1	1735	212	0.	*	1	2350	287	0.
1	0510	63	451.	*	1	1125	138	59.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	1085.	*	1	1130	139	55.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	1369.	*	1	1135	140	52.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	1165.	*	1	1140	141	48.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	1462.	*	1	1145	142	45.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	1234.	*	1	1150	143	42.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	1382.	*	1	1155	144	39.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	1432.	*	1	1200	145	37.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	1449.	*	1	1205	146	34.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	1715.	*	1	1210	147	32.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	1689.	*	1	1215	148	30.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	1672.	*	1	1220	149	28.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	1582.	*	1	1225	150	27.	*	1	1840	225	0.	*	2	0055	300	0.

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PEAK FLOW (CFS)	TIME (HR)	MAXIMUM AVERAGE FLOW (CFS) 6-HR	24-HR	72-HR	24.92-HR
+ 1715.	5.92	748.	198.	190.	190.
		(INCHES) .118	.125	.125	.125
		(AC-FT) 371.	392.	392.	392.

CUMULATIVE AREA = 58.84 SQ MI

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HYDROGRAPH AT STATION ULWIN
SUM OF 4 HYDROGRAPHS
PLAN 1, RATIO = .26

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DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	71.	1		1230	151	20.	1		1845	226	1.
1		0005	2	0.	1		0620	77	63.	1		1235	152	19.	1		1850	227	1.
1		0010	3	0.	1		0625	78	57.	1		1240	153	19.	1		1855	228	0.
1		0015	4	0.	1		0630	79	51.	1		1245	154	18.	1		1900	229	0.
1		0020	5	0.	1		0635	80	46.	1		1250	155	17.	1		1905	230	0.
1		0025	6	0.	1		0640	81	41.	1		1255	156	17.	1		1910	231	0.
1		0030	7	0.	1		0645	82	37.	1		1300	157	16.	1		1915	232	0.
1		0035	8	0.	1		0650	83	33.	1		1305	158	16.	1		1920	233	0.
1		0040	9	0.	1		0655	84	30.	1		1310	159	15.	1		1925	234	0.
1		0045	10	0.	1		0700	85	29.	1		1315	160	15.	1		1930	235	0.
1		0050	11	0.	1		0705	86	137.	1		1320	161	14.	1		1935	236	0.
1		0055	12	0.	1		0710	87	177.	1		1325	162	14.	1		1940	237	0.
1		0100	13	0.	1		0715	88	130.	1		1330	163	13.	1		1945	238	0.
1		0105	14	0.	1		0720	89	147.	1		1335	164	13.	1		1950	239	0.
1		0110	15	0.	1		0725	90	132.	1		1340	165	12.	1		1955	240	0.
1		0115	16	0.	1		0730	91	210.	1		1345	166	12.	1		2000	241	0.
1		0120	17	0.	1		0735	92	160.	1		1350	167	11.	1		2005	242	0.
1		0125	18	0.	1		0740	93	165.	1		1355	168	11.	1		2010	243	0.
1		0130	19	0.	1		0745	94	180.	1		1400	169	10.	1		2015	244	0.
1		0135	20	0.	1		0750	95	156.	1		1405	170	10.	1		2020	245	0.
1		0140	21	0.	1		0755	96	165.	1		1410	171	9.	1		2025	246	0.
1		0145	22	0.	1		0800	97	137.	1		1415	172	9.	1		2030	247	0.
1		0150	23	0.	1		0805	98	145.	1		1420	173	9.	1		2035	248	0.
1		0155	24	0.	1		0810	99	108.	1		1425	174	8.	1		2040	249	0.
1		0200	25	0.	1		0815	100	126.	1		1430	175	8.	1		2045	250	0.
1		0205	26	0.	1		0820	101	128.	1		1435	176	8.	1		2050	251	0.

1	0210	27	0.	*	1	0825	102	119.	*	1	1440	177	7.	*	1	2055	252	0.
1	0215	28	0.	*	1	0830	103	118.	*	1	1445	178	7.	*	1	2100	253	0.
1	0220	29	0.	*	1	0835	104	110.	*	1	1450	179	7.	*	1	2105	254	0.
1	0225	30	0.	*	1	0840	105	110.	*	1	1455	180	6.	*	1	2110	255	0.
1	0230	31	0.	*	1	0845	106	97.	*	1	1500	181	6.	*	1	2115	256	0.
1	0235	32	0.	*	1	0850	107	112.	*	1	1505	182	6.	*	1	2120	257	0.
1	0240	33	0.	*	1	0855	108	103.	*	1	1510	183	6.	*	1	2125	258	0.
1	0245	34	0.	*	1	0900	109	105.	*	1	1515	184	5.	*	1	2130	259	0.
1	0250	35	0.	*	1	0905	110	107.	*	1	1520	185	5.	*	1	2135	260	0.
1	0255	36	0.	*	1	0910	111	105.	*	1	1525	186	5.	*	1	2140	261	0.
1	0300	37	0.	*	1	0915	112	94.	*	1	1530	187	5.	*	1	2145	262	0.
1	0305	38	0.	*	1	0920	113	88.	*	1	1535	188	4.	*	1	2150	263	0.
1	0310	39	0.	*	1	0925	114	80.	*	1	1540	189	4.	*	1	2155	264	0.
1	0315	40	0.	*	1	0930	115	78.	*	1	1545	190	4.	*	1	2200	265	0.
1	0320	41	0.	*	1	0935	116	83.	*	1	1550	191	4.	*	1	2205	266	0.
1	0325	42	0.	*	1	0940	117	82.	*	1	1555	192	4.	*	1	2210	267	0.
1	0330	43	0.	*	1	0945	118	77.	*	1	1600	193	3.	*	1	2215	268	0.
1	0335	44	0.	*	1	0950	119	70.	*	1	1605	194	3.	*	1	2220	269	0.
1	0340	45	0.	*	1	0955	120	63.	*	1	1610	195	3.	*	1	2225	270	0.
1	0345	46	0.	*	1	1000	121	63.	*	1	1615	196	3.	*	1	2230	271	0.
1	0350	47	0.	*	1	1005	122	61.	*	1	1620	197	3.	*	1	2235	272	0.
1	0355	48	1.	*	1	1010	123	58.	*	1	1625	198	2.	*	1	2240	273	0.
1	0400	49	5.	*	1	1015	124	56.	*	1	1630	199	2.	*	1	2245	274	0.
1	0405	50	11.	*	1	1020	125	51.	*	1	1635	200	2.	*	1	2250	275	0.
1	0410	51	19.	*	1	1025	126	48.	*	1	1640	201	2.	*	1	2255	276	0.
1	0415	52	26.	*	1	1030	127	47.	*	1	1645	202	2.	*	1	2300	277	0.
1	0420	53	32.	*	1	1035	128	46.	*	1	1650	203	2.	*	1	2305	278	0.
1	0425	54	36.	*	1	1040	129	44.	*	1	1655	204	2.	*	1	2310	279	0.
1	0430	55	40.	*	1	1045	130	42.	*	1	1700	205	2.	*	1	2315	280	0.
1	0435	56	43.	*	1	1050	131	41.	*	1	1705	206	2.	*	1	2320	281	0.
1	0440	57	44.	*	1	1055	132	39.	*	1	1710	207	1.	*	1	2325	282	0.
1	0445	58	45.	*	1	1100	133	36.	*	1	1715	208	1.	*	1	2330	283	0.
1	0450	59	53.	*	1	1105	134	36.	*	1	1720	209	1.	*	1	2335	284	0.
1	0455	60	71.	*	1	1110	135	34.	*	1	1725	210	1.	*	1	2340	285	0.
1	0500	61	67.	*	1	1115	136	33.	*	1	1730	211	1.	*	1	2345	286	0.
1	0505	62	68.	*	1	1120	137	32.	*	1	1735	212	1.	*	1	2350	287	0.
1	0510	63	75.	*	1	1125	138	31.	*	1	1740	213	1.	*	1	2355	288	0.
1	0515	64	75.	*	1	1130	139	30.	*	1	1745	214	1.	*	2	0000	289	0.
1	0520	65	80.	*	1	1135	140	29.	*	1	1750	215	1.	*	2	0005	290	0.
1	0525	66	83.	*	1	1140	141	27.	*	1	1755	216	1.	*	2	0010	291	0.
1	0530	67	87.	*	1	1145	142	27.	*	1	1800	217	1.	*	2	0015	292	0.
1	0535	68	92.	*	1	1150	143	26.	*	1	1805	218	1.	*	2	0020	293	0.
1	0540	69	98.	*	1	1155	144	25.	*	1	1810	219	1.	*	2	0025	294	0.
1	0545	70	104.	*	1	1200	145	24.	*	1	1815	220	1.	*	2	0030	295	0.
1	0550	71	104.	*	1	1205	146	23.	*	1	1820	221	1.	*	2	0035	296	0.
1	0555	72	100.	*	1	1210	147	22.	*	1	1825	222	1.	*	2	0040	297	0.
1	0600	73	94.	*	1	1215	148	22.	*	1	1830	223	1.	*	2	0045	298	0.
1	0605	74	87.	*	1	1220	149	21.	*	1	1835	224	1.	*	2	0050	299	0.
1	0610	75	79.	*	1	1225	150	20.	*	1	1840	225	1.	*	2	0055	300	0.

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 210.	7.50		92.	28.	27.	27.
		(INCHES)	.014	.017	.017	.017
		(AC-FT)	45.	55.	55.	55.

CUMULATIVE AREA = 58.84 SQ MI

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            *            *
1306 KK     *    FINISH  *
            *            *
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1308 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           1  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE

               HYDROGRAPH ROUTING DATA

1307 RD          MUSKINGUM-CUNGE CHANNEL ROUTING
                          L       1500.  CHANNEL LENGTH
                          S       .0090  SLOPE
                          N        .050  CHANNEL ROUGHNESS COEFFICIENT
                         CA         .00  CONTRIBUTING AREA
                      SHAPE        TRAP  CHANNEL SHAPE
                         WD      250.00  BOTTOM WIDTH OR DIAMETER
                          Z        3.00  SIDE SLOPE
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COMPUTED MUSKINGUM-CUNGE PARAMETERS
COMPUTATION TIME STEP

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	.08	1.64	2.59	750.00	9761.97	326.77	1.01	9.64
			INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL					
MAIN	.08	1.64	5.00		9757.71	325.00	1.01	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4806E+04 EXCESS= .0000E+00 OUTFLOW= .4806E+04 BASIN STORAGE= .1190E-01 PERCENT ERROR= .0

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HYDROGRAPH AT STATION FINISH
PLAN 1, RATIO = 1.00

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DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	7886.	1		1230	151	2681.	1		1845	226	194.
1		0005	2	0.	1		0620	77	7665.	1		1235	152	2658.	1		1850	227	157.
1		0010	3	0.	1		0625	78	7451.	1		1240	153	2634.	1		1855	228	123.
1		0015	4	0.	1		0630	79	7241.	1		1245	154	2609.	1		1900	229	93.
1		0020	5	0.	1		0635	80	7037.	1		1250	155	2585.	1		1905	230	71.
1		0025	6	0.	1		0640	81	6841.	1		1255	156	2562.	1		1910	231	53.
1		0030	7	0.	1		0645	82	6669.	1		1300	157	2538.	1		1915	232	40.
1		0035	8	0.	1		0650	83	6548.	1		1305	158	2515.	1		1920	233	30.
1		0040	9	0.	1		0655	84	6485.	1		1310	159	2491.	1		1925	234	23.
1		0045	10	0.	1		0700	85	6433.	1		1315	160	2466.	1		1930	235	17.
1		0050	11	1.	1		0705	86	6339.	1		1320	161	2440.	1		1935	236	13.
1		0055	12	2.	1		0710	87	6201.	1		1325	162	2414.	1		1940	237	10.
1		0100	13	3.	1		0715	88	6031.	1		1330	163	2389.	1		1945	238	7.
1		0105	14	6.	1		0720	89	5837.	1		1335	164	2363.	1		1950	239	5.
1		0110	15	10.	1		0725	90	5625.	1		1340	165	2338.	1		1955	240	4.
1		0115	16	16.	1		0730	91	5404.	1		1345	166	2313.	1		2000	241	3.
1		0120	17	24.	1		0735	92	5188.	1		1350	167	2286.	1		2005	242	2.
1		0125	18	33.	1		0740	93	4999.	1		1355	168	2258.	1		2010	243	2.
1		0130	19	44.	1		0745	94	4853.	1		1400	169	2230.	1		2015	244	1.
1		0135	20	58.	1		0750	95	4738.	1		1405	170	2202.	1		2020	245	1.
1		0140	21	75.	1		0755	96	4636.	1		1410	171	2175.	1		2025	246	1.
1		0145	22	97.	1		0800	97	4540.	1		1415	172	2147.	1		2030	247	1.
1		0150	23	125.	1		0805	98	4451.	1		1420	173	2119.	1		2035	248	0.
1		0155	24	158.	1		0810	99	4370.	1		1425	174	2090.	1		2040	249	0.
1		0200	25	198.	1		0815	100	4294.	1		1430	175	2059.	1		2045	250	0.
1		0205	26	243.	1		0820	101	4222.	1		1435	176	2027.	1		2050	251	0.
1		0210	27	295.	1		0825	102	4153.	1		1440	177	1996.	1		2055	252	0.

1	0215	28	352.	*	1	0830	103	4089.	*	1	1445	178	1965.	*	1	2100	253	0.
1	0220	29	412.	*	1	0835	104	4029.	*	1	1450	179	1935.	*	1	2105	254	0.
1	0225	30	474.	*	1	0840	105	3972.	*	1	1455	180	1903.	*	1	2110	255	0.
1	0230	31	536.	*	1	0845	106	3918.	*	1	1500	181	1869.	*	1	2115	256	0.
1	0235	32	597.	*	1	0850	107	3866.	*	1	1505	182	1833.	*	1	2120	257	0.
1	0240	33	653.	*	1	0855	108	3818.	*	1	1510	183	1798.	*	1	2125	258	0.
1	0245	34	705.	*	1	0900	109	3772.	*	1	1515	184	1764.	*	1	2130	259	0.
1	0250	35	755.	*	1	0905	110	3728.	*	1	1520	185	1729.	*	1	2135	260	0.
1	0255	36	807.	*	1	0910	111	3687.	*	1	1525	186	1695.	*	1	2140	261	0.
1	0300	37	864.	*	1	0915	112	3649.	*	1	1530	187	1658.	*	1	2145	262	0.
1	0305	38	932.	*	1	0920	113	3613.	*	1	1535	188	1621.	*	1	2150	263	0.
1	0310	39	1021.	*	1	0925	114	3578.	*	1	1540	189	1584.	*	1	2155	264	0.
1	0315	40	1146.	*	1	0930	115	3544.	*	1	1545	190	1548.	*	1	2200	265	0.
1	0320	41	1326.	*	1	0935	116	3511.	*	1	1550	191	1512.	*	1	2205	266	0.
1	0325	42	1586.	*	1	0940	117	3480.	*	1	1555	192	1476.	*	1	2210	267	0.
1	0330	43	1950.	*	1	0945	118	3449.	*	1	1600	193	1439.	*	1	2215	268	0.
1	0335	44	2447.	*	1	0950	119	3420.	*	1	1605	194	1400.	*	1	2220	269	0.
1	0340	45	3064.	*	1	0955	120	3391.	*	1	1610	195	1361.	*	1	2225	270	0.
1	0345	46	3761.	*	1	1000	121	3364.	*	1	1615	196	1324.	*	1	2230	271	0.
1	0350	47	4510.	*	1	1005	122	3338.	*	1	1620	197	1287.	*	1	2235	272	0.
1	0355	48	5284.	*	1	1010	123	3312.	*	1	1625	198	1250.	*	1	2240	273	0.
1	0400	49	6016.	*	1	1015	124	3287.	*	1	1630	199	1212.	*	1	2245	274	0.
1	0405	50	6641.	*	1	1020	125	3263.	*	1	1635	200	1173.	*	1	2250	275	0.
1	0410	51	7144.	*	1	1025	126	3239.	*	1	1640	201	1133.	*	1	2255	276	0.
1	0415	52	7539.	*	1	1030	127	3214.	*	1	1645	202	1095.	*	1	2300	277	0.
1	0420	53	7840.	*	1	1035	128	3190.	*	1	1650	203	1057.	*	1	2305	278	0.
1	0425	54	8062.	*	1	1040	129	3166.	*	1	1655	204	1021.	*	1	2310	279	0.
1	0430	55	8223.	*	1	1045	130	3143.	*	1	1700	205	983.	*	1	2315	280	0.
1	0435	56	8344.	*	1	1050	131	3121.	*	1	1705	206	944.	*	1	2320	281	0.
1	0440	57	8438.	*	1	1055	132	3099.	*	1	1710	207	904.	*	1	2325	282	0.
1	0445	58	8514.	*	1	1100	133	3078.	*	1	1715	208	865.	*	1	2330	283	0.
1	0450	59	8609.	*	1	1105	134	3057.	*	1	1720	209	828.	*	1	2335	284	0.
1	0455	60	8759.	*	1	1110	135	3035.	*	1	1725	210	793.	*	1	2340	285	0.
1	0500	61	8959.	*	1	1115	136	3013.	*	1	1730	211	757.	*	1	2345	286	0.
1	0505	62	9176.	*	1	1120	137	2990.	*	1	1735	212	720.	*	1	2350	287	0.
1	0510	63	9387.	*	1	1125	138	2968.	*	1	1740	213	681.	*	1	2355	288	0.
1	0515	64	9572.	*	1	1130	139	2946.	*	1	1745	214	641.	*	2	0000	289	0.
1	0520	65	9702.	*	1	1135	140	2925.	*	1	1750	215	603.	*	2	0005	290	0.
1	0525	66	9758.	*	1	1140	141	2904.	*	1	1755	216	567.	*	2	0010	291	0.
1	0530	67	9742.	*	1	1145	142	2882.	*	1	1800	217	533.	*	2	0015	292	0.
1	0535	68	9659.	*	1	1150	143	2861.	*	1	1805	218	499.	*	2	0020	293	0.
1	0540	69	9519.	*	1	1155	144	2839.	*	1	1810	219	461.	*	2	0025	294	0.
1	0545	70	9333.	*	1	1200	145	2816.	*	1	1815	220	417.	*	2	0030	295	0.
1	0550	71	9113.	*	1	1205	146	2793.	*	1	1820	221	373.	*	2	0035	296	0.
1	0555	72	8873.	*	1	1210	147	2770.	*	1	1825	222	332.	*	2	0040	297	0.
1	0600	73	8623.	*	1	1215	148	2748.	*	1	1830	223	295.	*	2	0045	298	0.
1	0605	74	8369.	*	1	1220	149	2726.	*	1	1835	224	261.	*	2	0050	299	0.
1	0610	75	8120.	*	1	1225	150	2704.	*	1	1840	225	229.	*	2	0055	300	0.
				*					*					*				

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PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)				
		(CFS)			
+ 9758.	5.42	6359.	2423.	2334.	2334.
		(INCHES) .665	1.014	1.014	1.014
		(AC-FT) 3153.	4806.	4806.	4806.

CUMULATIVE AREA = 88.86 SQ MI

COMPUTED MUSKINGUM-CUNGE PARAMETERS

ELEMENT	ALPHA	M	COMPUTATION TIME STEP DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	.08	1.64	2.81	750.00	7955.75	328.58	.77	8.90
			INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL					
MAIN	.08	1.64	5.00		7952.47	330.00	.77	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3663E+04 EXCESS= .0000E+00 OUTFLOW= .3663E+04 BASIN STORAGE= .1060E-01 PERCENT ERROR= .0

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HYDROGRAPH AT STATION FINISH
PLAN 1, RATIO = .87

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	6631.	1		1230	151	2052.	1		1845	226	0.
1		0005	2	0.	1		0620	77	6465.	1		1235	152	2020.	1		1850	227	0.
1		0010	3	0.	1		0625	78	6303.	1		1240	153	1987.	1		1855	228	0.
1		0015	4	0.	1		0630	79	6144.	1		1245	154	1955.	1		1900	229	0.
1		0020	5	0.	1		0635	80	5988.	1		1250	155	1923.	1		1905	230	0.
1		0025	6	0.	1		0640	81	5835.	1		1255	156	1888.	1		1910	231	0.
1		0030	7	0.	1		0645	82	5686.	1		1300	157	1852.	1		1915	232	0.
1		0035	8	0.	1		0650	83	5540.	1		1305	158	1816.	1		1920	233	0.
1		0040	9	0.	1		0655	84	5401.	1		1310	159	1780.	1		1925	234	0.
1		0045	10	0.	1		0700	85	5265.	1		1315	160	1745.	1		1930	235	0.
1		0050	11	0.	1		0705	86	5134.	1		1320	161	1710.	1		1935	236	0.
1		0055	12	0.	1		0710	87	5008.	1		1325	162	1674.	1		1940	237	0.
1		0100	13	0.	1		0715	88	4889.	1		1330	163	1636.	1		1945	238	0.
1		0105	14	0.	1		0720	89	4774.	1		1335	164	1598.	1		1950	239	0.
1		0110	15	1.	1		0725	90	4665.	1		1340	165	1561.	1		1955	240	0.
1		0115	16	1.	1		0730	91	4559.	1		1345	166	1525.	1		2000	241	0.
1		0120	17	2.	1		0735	92	4456.	1		1350	167	1489.	1		2005	242	0.
1		0125	18	4.	1		0740	93	4356.	1		1355	168	1451.	1		2010	243	0.
1		0130	19	6.	1		0745	94	4260.	1		1400	169	1412.	1		2015	244	0.
1		0135	20	11.	1		0750	95	4168.	1		1405	170	1373.	1		2020	245	0.
1		0140	21	17.	1		0755	96	4082.	1		1410	171	1335.	1		2025	246	0.
1		0145	22	26.	1		0800	97	4001.	1		1415	172	1298.	1		2030	247	0.
1		0150	23	39.	1		0805	98	3926.	1		1420	173	1261.	1		2035	248	0.
1		0155	24	56.	1		0810	99	3856.	1		1425	174	1223.	1		2040	249	0.
1		0200	25	77.	1		0815	100	3791.	1		1430	175	1184.	1		2045	250	0.
1		0205	26	103.	1		0820	101	3729.	1		1435	176	1144.	1		2050	251	0.
1		0210	27	134.	1		0825	102	3670.	1		1440	177	1105.	1		2055	252	0.
1		0215	28	168.	1		0830	103	3614.	1		1445	178	1068.	1		2100	253	0.
1		0220	29	206.	1		0835	104	3561.	1		1450	179	1031.	1		2105	254	0.
1		0225	30	246.	1		0840	105	3511.	1		1455	180	993.	1		2110	255	0.
1		0230	31	287.	1		0845	106	3463.	1		1500	181	955.	1		2115	256	0.
1		0235	32	327.	1		0850	107	3416.	1		1505	182	915.	1		2120	257	0.
1		0240	33	366.	1		0855	108	3372.	1		1510	183	876.	1		2125	258	0.
1		0245	34	400.	1		0900	109	3328.	1		1515	184	839.	1		2130	259	0.
1		0250	35	431.	1		0905	110	3286.	1		1520	185	803.	1		2135	260	0.
1		0255	36	462.	1		0910	111	3245.	1		1525	186	767.	1		2140	261	0.
1		0300	37	498.	1		0915	112	3207.	1		1530	187	730.	1		2145	262	0.
1		0305	38	542.	1		0920	113	3170.	1		1535	188	692.	1		2150	263	0.
1		0310	39	605.	1		0925	114	3135.	1		1540	189	652.	1		2155	264	0.
1		0315	40	696.	1		0930	115	3101.	1		1545	190	614.	1		2200	265	0.
1		0320	41	824.	1		0935	116	3069.	1		1550	191	578.	1		2205	266	0.
1		0325	42	1007.	1		0940	117	3037.	1		1555	192	544.	1		2210	267	0.
1		0330	43	1266.	1		0945	118	3005.	1		1600	193	511.	1		2215	268	0.
1		0335	44	1620.	1		0950	119	2973.	1		1605	194	475.	1		2220	269	0.
1		0340	45	2066.	1		0955	120	2941.	1		1610	195	436.	1		2225	270	0.
1		0345	46	2589.	1		1000	121	2910.	1		1615	196	393.	1		2230	271	0.
1		0350	47	3180.	1		1005	122	2880.	1		1620	197	351.	1		2235	272	0.
1		0355	48	3816.	1		1010	123	2851.	1		1625	198	313.	1		2240	273	0.
1		0400	49	4426.	1		1015	124	2823.	1		1630	199	278.	1		2245	274	0.
1		0405	50	4954.	1		1020	125	2795.	1		1635	200	247.	1		2250	275	0.
1		0410	51	5388.	1		1025	126	2767.	1		1640	201	215.	1		2255	276	0.
1		0415	52	5725.	1		1030	127	2738.	1		1645	202	180.	1		2300	277	0.
1		0420	53	5973.	1		1035	128	2710.	1		1650	203	144.	1		2305	278	0.
1		0425	54	6147.	1		1040	129	2681.	1		1655	204	111.	1		2310	279	0.
1		0430	55	6267.	1		1045	130	2653.	1		1700	205	84.	1		2315	280	0.
1		0435	56	6367.	1		1050	131	2626.	1		1705	206	63.	1		2320	281	0.
1		0440	57	6469.	1		1055	132	2599.	1		1710	207	48.	1		2325	282	0.
1		0445	58	6579.	1		1100	133	2573.	1		1715	208	36.	1		2330	283	0.
1		0450	59	6711.	1		1105	134	2546.	1		1720	209	27.	1		2335	284	0.
1		0455	60	6885.	1		1110	135	2518.	1		1725	210	21.	1		2340	285	0.
1		0500	61	7097.	1		1115	136	2490.	1		1730	211	16.	1		2345	286	0.
1		0505	62	7320.	1		1120	137	2461.	1		1735	212	12.	1		2350	287	0.
1		0510	63	7533.	1		1125	138	2434.	1		1740	213	9.	1		2355	288	0.
1		0515	64	7721.	1		1130	139	2406.	1		1745	214	7.	2		0000	289	0.
1		0520	65	7863.	1		1135	140	2379.	1		1750	215	5.	2		0005	290	0.
1		0525	66	7939.	1		1140	141	2352.	1		1755	216	4.	2		0010	291	0.
1		0530	67	7952.	1		1145	142	2323.	1		1800	217	3.	2		0015	292	0.
1		0535	68	7911.	1		1150	143	2294.	1		1805	218	2.	2		0020	293	0.
1		0540	69	7823.	1		1155	144	2264.	1		1810	219	2.	2		0025	294	0.
1		0545	70	7695.	1		1200	145	2235.	1		1815	220	1.	2		0030	295	0.
1		0550	71	7537.	1		1205	146	2205.	1		1820	221	1.	2		0035	296	0.
1		0555	72	7362.	1		1210	147	2177.	1		1825	222	1.	2		0040	297	0.
1		0600	73	7177.	1		1215	148	2147.	1		1830	223	1.	2		0045	298	0.

1	0605	74	6989.	*	1	1220	149	2117.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	6806.	*	1	1225	150	2085.	*	1	1840	225	0.	*	2	0055	300	0.

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PEAK FLOW (CFS)	TIME (HR)	MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
+		(CFS)			
+ 7952.	5.50	5231.	1847.	1779.	1779.
		(INCHES) .547	.773	.773	.773
		(AC-FT) 2594.	3663.	3663.	3663.

CUMULATIVE AREA = 88.86 SQ MI

COMPUTED MUSKINGUM-CUNGE PARAMETERS
COMPUTATION TIME STEP

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	.08	1.64	3.11	750.00	6111.55	332.97	.55	8.03
			INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL					
MAIN	.08	1.64	5.00		6103.91	330.00	.55	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2613E+04 EXCESS= .0000E+00 OUTFLOW= .2613E+04 BASIN STORAGE= .1096E-01 PERCENT ERROR= .0

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HYDROGRAPH AT STATION FINISH
PLAN 1, RATIO = .74

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DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	*	1		0615	76	5275.	*	1		1230	151	1208.	*	1		1845	226	0.
1		0005	2	0.	*	1		0620	77	5162.	*	1		1235	152	1168.	*	1		1850	227	0.
1		0010	3	0.	*	1		0625	78	5052.	*	1		1240	153	1128.	*	1		1855	228	0.
1		0015	4	0.	*	1		0630	79	4943.	*	1		1245	154	1089.	*	1		1900	229	0.
1		0020	5	0.	*	1		0635	80	4835.	*	1		1250	155	1052.	*	1		1905	230	0.
1		0025	6	0.	*	1		0640	81	4727.	*	1		1255	156	1014.	*	1		1910	231	0.
1		0030	7	0.	*	1		0645	82	4619.	*	1		1300	157	975.	*	1		1915	232	0.
1		0035	8	0.	*	1		0650	83	4513.	*	1		1305	158	935.	*	1		1920	233	0.
1		0040	9	0.	*	1		0655	84	4410.	*	1		1310	159	896.	*	1		1925	234	0.
1		0045	10	0.	*	1		0700	85	4309.	*	1		1315	160	857.	*	1		1930	235	0.
1		0050	11	0.	*	1		0705	86	4212.	*	1		1320	161	820.	*	1		1935	236	0.
1		0055	12	0.	*	1		0710	87	4117.	*	1		1325	162	785.	*	1		1940	237	0.
1		0100	13	0.	*	1		0715	88	4026.	*	1		1330	163	748.	*	1		1945	238	0.
1		0105	14	0.	*	1		0720	89	3939.	*	1		1335	164	710.	*	1		1950	239	0.
1		0110	15	0.	*	1		0725	90	3854.	*	1		1340	165	670.	*	1		1955	240	0.
1		0115	16	0.	*	1		0730	91	3772.	*	1		1345	166	631.	*	1		2000	241	0.
1		0120	17	0.	*	1		0735	92	3692.	*	1		1350	167	594.	*	1		2005	242	0.
1		0125	18	0.	*	1		0740	93	3614.	*	1		1355	168	560.	*	1		2010	243	0.
1		0130	19	0.	*	1		0745	94	3538.	*	1		1400	169	526.	*	1		2015	244	0.
1		0135	20	0.	*	1		0750	95	3465.	*	1		1405	170	492.	*	1		2020	245	0.
1		0140	21	1.	*	1		0755	96	3395.	*	1		1410	171	456.	*	1		2025	246	0.
1		0145	22	2.	*	1		0800	97	3329.	*	1		1415	172	417.	*	1		2030	247	0.
1		0150	23	4.	*	1		0805	98	3266.	*	1		1420	173	376.	*	1		2035	248	0.
1		0155	24	8.	*	1		0810	99	3207.	*	1		1425	174	338.	*	1		2040	249	0.
1		0200	25	14.	*	1		0815	100	3151.	*	1		1430	175	302.	*	1		2045	250	0.
1		0205	26	23.	*	1		0820	101	3098.	*	1		1435	176	270.	*	1		2050	251	0.
1		0210	27	35.	*	1		0825	102	3046.	*	1		1440	177	239.	*	1		2055	252	0.
1		0215	28	50.	*	1		0830	103	2997.	*	1		1445	178	207.	*	1		2100	253	0.
1		0220	29	68.	*	1		0835	104	2950.	*	1		1450	179	172.	*	1		2105	254	0.
1		0225	30	88.	*	1		0840	105	2905.	*	1		1455	180	137.	*	1		2110	255	0.
1		0230	31	110.	*	1		0845	106	2861.	*	1		1500	181	106.	*	1		2115	256	0.
1		0235	32	133.	*	1		0850	107	2818.	*	1		1505	182	81.	*	1		2120	257	0.
1		0240	33	155.	*	1		0855	108	2776.	*	1		1510	183	62.	*	1		2125	258	0.
1		0245	34	176.	*	1		0900	109	2735.	*	1		1515	184	47.	*	1		2130	259	0.
1		0250	35	195.	*	1		0905	110	2694.	*	1		1520	185	36.	*	1		2135	260	0.
1		0255	36	214.	*	1		0910	111	2655.	*	1		1525	186	27.	*	1		2140	261	0.
1		0300	37	235.	*	1		0915	112	2617.	*	1		1530	187	21.	*	1		2145	262	0.
1		0305	38	262.	*	1		0920	113	2581.	*	1		1535	188	16.	*	1		2150	263	0.

1	0310	39	298.	*	1	0925	114	2546.	*	1	1540	189	12.	*	1	2155	264	0.
1	0315	40	348.	*	1	0930	115	2511.	*	1	1545	190	9.	*	1	2200	265	0.
1	0320	41	421.	*	1	0935	116	2477.	*	1	1550	191	7.	*	1	2205	266	0.
1	0325	42	529.	*	1	0940	117	2442.	*	1	1555	192	6.	*	1	2210	267	0.
1	0330	43	691.	*	1	0945	118	2407.	*	1	1600	193	4.	*	1	2215	268	0.
1	0335	44	924.	*	1	0950	119	2372.	*	1	1605	194	3.	*	1	2220	269	0.
1	0340	45	1236.	*	1	0955	120	2338.	*	1	1610	195	3.	*	1	2225	270	0.
1	0345	46	1616.	*	1	1000	121	2304.	*	1	1615	196	2.	*	1	2230	271	0.
1	0350	47	2039.	*	1	1005	122	2271.	*	1	1620	197	1.	*	1	2235	272	0.
1	0355	48	2494.	*	1	1010	123	2239.	*	1	1625	198	1.	*	1	2240	273	0.
1	0400	49	2946.	*	1	1015	124	2206.	*	1	1630	199	1.	*	1	2245	274	0.
1	0405	50	3354.	*	1	1020	125	2171.	*	1	1635	200	1.	*	1	2250	275	0.
1	0410	51	3709.	*	1	1025	126	2136.	*	1	1640	201	1.	*	1	2255	276	0.
1	0415	52	4005.	*	1	1030	127	2100.	*	1	1645	202	0.	*	1	2300	277	0.
1	0420	53	4224.	*	1	1035	128	2066.	*	1	1650	203	0.	*	1	2305	278	0.
1	0425	54	4373.	*	1	1040	129	2032.	*	1	1655	204	0.	*	1	2310	279	0.
1	0430	55	4465.	*	1	1045	130	1998.	*	1	1700	205	0.	*	1	2315	280	0.
1	0435	56	4519.	*	1	1050	131	1963.	*	1	1705	206	0.	*	1	2320	281	0.
1	0440	57	4573.	*	1	1055	132	1927.	*	1	1710	207	0.	*	1	2325	282	0.
1	0445	58	4650.	*	1	1100	133	1890.	*	1	1715	208	0.	*	1	2330	283	0.
1	0450	59	4770.	*	1	1105	134	1852.	*	1	1720	209	0.	*	1	2335	284	0.
1	0455	60	4940.	*	1	1110	135	1816.	*	1	1725	210	0.	*	1	2340	285	0.
1	0500	61	5150.	*	1	1115	136	1780.	*	1	1730	211	0.	*	1	2345	286	0.
1	0505	62	5377.	*	1	1120	137	1743.	*	1	1735	212	0.	*	1	2350	287	0.
1	0510	63	5597.	*	1	1125	138	1706.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	5796.	*	1	1130	139	1668.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	5954.	*	1	1135	140	1629.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	6055.	*	1	1140	141	1591.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	6104.	*	1	1145	142	1554.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	6102.	*	1	1150	143	1517.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	6060.	*	1	1155	144	1479.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	5985.	*	1	1200	145	1440.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	5885.	*	1	1205	146	1400.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	5769.	*	1	1210	147	1361.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	5645.	*	1	1215	148	1323.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	5519.	*	1	1220	149	1286.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	5394.	*	1	1225	150	1247.	*	1	1840	225	0.	*	2	0055	300	0.

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)	(CFS)				
+ 6104.	5.50		4073.	1318.	1269.	1269.
		(INCHES)	.426	.551	.551	.551
		(AC-FT)	2020.	2613.	2613.	2613.

CUMULATIVE AREA = 88.86 SQ MI

COMPUTED MUSKINGUM-CUNGE PARAMETERS
COMPUTATION TIME STEP

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	.08	1.64	3.82	750.00	3612.02	343.61	.30	6.55

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

MAIN	.08	1.64	5.00		3611.84	340.00	.30

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1425E+04 EXCESS= .0000E+00 OUTFLOW= .1425E+04 BASIN STORAGE= .1110E-01 PERCENT ERROR= .0

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HYDROGRAPH AT STATION FINISH
PLAN 1, RATIO = .57

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DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	*	1		0615	76	3337.	*	1		1230	151	240.	*	1		1845	226	0.
1		0005	2	0.	*	1		0620	77	3290.	*	1		1235	152	215.	*	1		1850	227	0.
1		0010	3	0.	*	1		0625	78	3243.	*	1		1240	153	186.	*	1		1855	228	0.

1	0015	4	0.	*	1	0630	79	3194.	*	1	1245	154	155.	*	1	1900	229	0.
1	0020	5	0.	*	1	0635	80	3144.	*	1	1250	155	126.	*	1	1905	230	0.
1	0025	6	0.	*	1	0640	81	3092.	*	1	1255	156	101.	*	1	1910	231	0.
1	0030	7	0.	*	1	0645	82	3039.	*	1	1300	157	82.	*	1	1915	232	0.
1	0035	8	0.	*	1	0650	83	2987.	*	1	1305	158	67.	*	1	1920	233	0.
1	0040	9	0.	*	1	0655	84	2934.	*	1	1310	159	55.	*	1	1925	234	0.
1	0045	10	0.	*	1	0700	85	2880.	*	1	1315	160	46.	*	1	1930	235	0.
1	0050	11	0.	*	1	0705	86	2825.	*	1	1320	161	39.	*	1	1935	236	0.
1	0055	12	0.	*	1	0710	87	2770.	*	1	1325	162	33.	*	1	1940	237	0.
1	0100	13	0.	*	1	0715	88	2716.	*	1	1330	163	28.	*	1	1945	238	0.
1	0105	14	0.	*	1	0720	89	2662.	*	1	1335	164	24.	*	1	1950	239	0.
1	0110	15	0.	*	1	0725	90	2609.	*	1	1340	165	21.	*	1	1955	240	0.
1	0115	16	0.	*	1	0730	91	2555.	*	1	1345	166	19.	*	1	2000	241	0.
1	0120	17	0.	*	1	0735	92	2502.	*	1	1350	167	17.	*	1	2005	242	0.
1	0125	18	0.	*	1	0740	93	2448.	*	1	1355	168	15.	*	1	2010	243	0.
1	0130	19	0.	*	1	0745	94	2395.	*	1	1400	169	13.	*	1	2015	244	0.
1	0135	20	0.	*	1	0750	95	2343.	*	1	1405	170	12.	*	1	2020	245	0.
1	0140	21	0.	*	1	0755	96	2292.	*	1	1410	171	11.	*	1	2025	246	0.
1	0145	22	0.	*	1	0800	97	2242.	*	1	1415	172	10.	*	1	2030	247	0.
1	0150	23	0.	*	1	0805	98	2194.	*	1	1420	173	9.	*	1	2035	248	0.
1	0155	24	0.	*	1	0810	99	2148.	*	1	1425	174	8.	*	1	2040	249	0.
1	0200	25	0.	*	1	0815	100	2104.	*	1	1430	175	7.	*	1	2045	250	0.
1	0205	26	0.	*	1	0820	101	2061.	*	1	1435	176	7.	*	1	2050	251	0.
1	0210	27	0.	*	1	0825	102	2018.	*	1	1440	177	6.	*	1	2055	252	0.
1	0215	28	1.	*	1	0830	103	1977.	*	1	1445	178	5.	*	1	2100	253	0.
1	0220	29	2.	*	1	0835	104	1935.	*	1	1450	179	5.	*	1	2105	254	0.
1	0225	30	3.	*	1	0840	105	1893.	*	1	1455	180	4.	*	1	2110	255	0.
1	0230	31	5.	*	1	0845	106	1851.	*	1	1500	181	4.	*	1	2115	256	0.
1	0235	32	8.	*	1	0850	107	1810.	*	1	1505	182	4.	*	1	2120	257	0.
1	0240	33	12.	*	1	0855	108	1770.	*	1	1510	183	3.	*	1	2125	258	0.
1	0245	34	17.	*	1	0900	109	1731.	*	1	1515	184	3.	*	1	2130	259	0.
1	0250	35	22.	*	1	0905	110	1692.	*	1	1520	185	3.	*	1	2135	260	0.
1	0255	36	27.	*	1	0910	111	1655.	*	1	1525	186	2.	*	1	2140	261	0.
1	0300	37	34.	*	1	0915	112	1617.	*	1	1530	187	2.	*	1	2145	262	0.
1	0305	38	43.	*	1	0920	113	1579.	*	1	1535	188	2.	*	1	2150	263	0.
1	0310	39	55.	*	1	0925	114	1540.	*	1	1540	189	2.	*	1	2155	264	0.
1	0315	40	73.	*	1	0930	115	1501.	*	1	1545	190	2.	*	1	2200	265	0.
1	0320	41	100.	*	1	0935	116	1463.	*	1	1550	191	2.	*	1	2205	266	0.
1	0325	42	140.	*	1	0940	117	1426.	*	1	1555	192	1.	*	1	2210	267	0.
1	0330	43	198.	*	1	0945	118	1389.	*	1	1600	193	1.	*	1	2215	268	0.
1	0335	44	290.	*	1	0950	119	1353.	*	1	1605	194	1.	*	1	2220	269	0.
1	0340	45	437.	*	1	0955	120	1317.	*	1	1610	195	1.	*	1	2225	270	0.
1	0345	46	628.	*	1	1000	121	1279.	*	1	1615	196	1.	*	1	2230	271	0.
1	0350	47	862.	*	1	1005	122	1241.	*	1	1620	197	1.	*	1	2235	272	0.
1	0355	48	1124.	*	1	1010	123	1203.	*	1	1625	198	1.	*	1	2240	273	0.
1	0400	49	1388.	*	1	1015	124	1165.	*	1	1630	199	1.	*	1	2245	274	0.
1	0405	50	1631.	*	1	1020	125	1129.	*	1	1635	200	1.	*	1	2250	275	0.
1	0410	51	1843.	*	1	1025	126	1093.	*	1	1640	201	1.	*	1	2255	276	0.
1	0415	52	2029.	*	1	1030	127	1057.	*	1	1645	202	1.	*	1	2300	277	0.
1	0420	53	2190.	*	1	1035	128	1020.	*	1	1650	203	0.	*	1	2305	278	0.
1	0425	54	2316.	*	1	1040	129	983.	*	1	1655	204	0.	*	1	2310	279	0.
1	0430	55	2414.	*	1	1045	130	945.	*	1	1700	205	0.	*	1	2315	280	0.
1	0435	56	2488.	*	1	1050	131	907.	*	1	1705	206	0.	*	1	2320	281	0.
1	0440	57	2531.	*	1	1055	132	871.	*	1	1710	207	0.	*	1	2325	282	0.
1	0445	58	2556.	*	1	1100	133	837.	*	1	1715	208	0.	*	1	2330	283	0.
1	0450	59	2585.	*	1	1105	134	802.	*	1	1720	209	0.	*	1	2335	284	0.
1	0455	60	2640.	*	1	1110	135	768.	*	1	1725	210	0.	*	1	2340	285	0.
1	0500	61	2740.	*	1	1115	136	731.	*	1	1730	211	0.	*	1	2345	286	0.
1	0505	62	2876.	*	1	1120	137	694.	*	1	1735	212	0.	*	1	2350	287	0.
1	0510	63	3037.	*	1	1125	138	656.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	3202.	*	1	1130	139	621.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	3348.	*	1	1135	140	587.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	3463.	*	1	1140	141	555.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	3539.	*	1	1145	142	524.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	3588.	*	1	1150	143	491.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	3612.	*	1	1155	144	456.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	3606.	*	1	1200	145	418.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	3580.	*	1	1205	146	381.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	3542.	*	1	1210	147	347.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	3494.	*	1	1215	148	317.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	3440.	*	1	1220	149	289.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	3387.	*	1	1225	150	264.	*	1	1840	225	0.	*	2	0055	300	0.
				*					*					*				

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PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)				
		(CFS)			
+ 3612.	5.67	2480.	718.	692.	692.
		(INCHES) .259	.301	.301	.301

(AC-FT) 1230. 1425. 1425. 1425.

CUMULATIVE AREA = 88.86 SQ MI

COMPUTED MUSKINGUM-CUNGE PARAMETERS

ELEMENT	ALPHA	M	COMPUTATION TIME STEP DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	.08	1.64	5.00	750.00	1809.41	349.86	.15	5.00
INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL								
MAIN	.08	1.64	5.00		1809.17	350.00	.15	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .7048E+03 EXCESS= .0000E+00 OUTFLOW= .7049E+03 BASIN STORAGE= .1024E-01 PERCENT ERROR= .0

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HYDROGRAPH AT STATION FINISH
PLAN 1, RATIO = .44

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DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	1751.	1		1230	151	63.	1		1845	226	0.
1		0005	2	0.	1		0620	77	1744.	1		1235	152	59.	1		1850	227	0.
1		0010	3	0.	1		0625	78	1740.	1		1240	153	55.	1		1855	228	0.
1		0015	4	0.	1		0630	79	1731.	1		1245	154	52.	1		1900	229	0.
1		0020	5	0.	1		0635	80	1716.	1		1250	155	48.	1		1905	230	0.
1		0025	6	0.	1		0640	81	1701.	1		1255	156	45.	1		1910	231	0.
1		0030	7	0.	1		0645	82	1679.	1		1300	157	42.	1		1915	232	0.
1		0035	8	0.	1		0650	83	1655.	1		1305	158	40.	1		1920	233	0.
1		0040	9	0.	1		0655	84	1630.	1		1310	159	37.	1		1925	234	0.
1		0045	10	0.	1		0700	85	1605.	1		1315	160	35.	1		1930	235	0.
1		0050	11	0.	1		0705	86	1581.	1		1320	161	33.	1		1935	236	0.
1		0055	12	0.	1		0710	87	1555.	1		1325	162	31.	1		1940	237	0.
1		0100	13	0.	1		0715	88	1529.	1		1330	163	29.	1		1945	238	0.
1		0105	14	0.	1		0720	89	1504.	1		1335	164	27.	1		1950	239	0.
1		0110	15	0.	1		0725	90	1478.	1		1340	165	25.	1		1955	240	0.
1		0115	16	0.	1		0730	91	1451.	1		1345	166	24.	1		2000	241	0.
1		0120	17	0.	1		0735	92	1424.	1		1350	167	22.	1		2005	242	0.
1		0125	18	0.	1		0740	93	1395.	1		1355	168	21.	1		2010	243	0.
1		0130	19	0.	1		0745	94	1365.	1		1400	169	20.	1		2015	244	0.
1		0135	20	0.	1		0750	95	1335.	1		1405	170	18.	1		2020	245	0.
1		0140	21	0.	1		0755	96	1304.	1		1410	171	17.	1		2025	246	0.
1		0145	22	0.	1		0800	97	1274.	1		1415	172	16.	1		2030	247	0.
1		0150	23	0.	1		0805	98	1244.	1		1420	173	15.	1		2035	248	0.
1		0155	24	0.	1		0810	99	1215.	1		1425	174	14.	1		2040	249	0.
1		0200	25	0.	1		0815	100	1186.	1		1430	175	13.	1		2045	250	0.
1		0205	26	0.	1		0820	101	1155.	1		1435	176	12.	1		2050	251	0.
1		0210	27	0.	1		0825	102	1124.	1		1440	177	11.	1		2055	252	0.
1		0215	28	0.	1		0830	103	1092.	1		1445	178	11.	1		2100	253	0.
1		0220	29	0.	1		0835	104	1061.	1		1450	179	10.	1		2105	254	0.
1		0225	30	0.	1		0840	105	1030.	1		1455	180	9.	1		2110	255	0.
1		0230	31	0.	1		0845	106	1000.	1		1500	181	9.	1		2115	256	0.
1		0235	32	0.	1		0850	107	971.	1		1505	182	8.	1		2120	257	0.
1		0240	33	0.	1		0855	108	942.	1		1510	183	7.	1		2125	258	0.
1		0245	34	0.	1		0900	109	913.	1		1515	184	7.	1		2130	259	0.
1		0250	35	0.	1		0905	110	885.	1		1520	185	7.	1		2135	260	0.
1		0255	36	0.	1		0910	111	858.	1		1525	186	6.	1		2140	261	0.
1		0300	37	0.	1		0915	112	831.	1		1530	187	6.	1		2145	262	0.
1		0305	38	0.	1		0920	113	803.	1		1535	188	5.	1		2150	263	0.
1		0310	39	1.	1		0925	114	772.	1		1540	189	5.	1		2155	264	0.
1		0315	40	2.	1		0930	115	740.	1		1545	190	5.	1		2200	265	0.
1		0320	41	5.	1		0935	116	709.	1		1550	191	5.	1		2205	266	0.
1		0325	42	11.	1		0940	117	680.	1		1555	192	4.	1		2210	267	0.
1		0330	43	23.	1		0945	118	652.	1		1600	193	4.	1		2215	268	0.
1		0335	44	44.	1		0950	119	625.	1		1605	194	4.	1		2220	269	0.
1		0340	45	82.	1		0955	120	599.	1		1610	195	4.	1		2225	270	0.
1		0345	46	142.	1		1000	121	575.	1		1615	196	3.	1		2230	271	0.
1		0350	47	244.	1		1005	122	551.	1		1620	197	3.	1		2235	272	0.
1		0355	48	368.	1		1010	123	527.	1		1625	198	3.	1		2240	273	0.
1		0400	49	509.	1		1015	124	502.	1		1630	199	3.	1		2245	274	0.

1	0405	50	655.	*	1	1020	125	473.	*	1	1635	200	3.	*	1	2250	275	0.
1	0410	51	778.	*	1	1025	126	440.	*	1	1640	201	2.	*	1	2255	276	0.
1	0415	52	879.	*	1	1030	127	408.	*	1	1645	202	2.	*	1	2300	277	0.
1	0420	53	961.	*	1	1035	128	382.	*	1	1650	203	2.	*	1	2305	278	0.
1	0425	54	1030.	*	1	1040	129	358.	*	1	1655	204	2.	*	1	2310	279	0.
1	0430	55	1088.	*	1	1045	130	334.	*	1	1700	205	2.	*	1	2315	280	0.
1	0435	56	1143.	*	1	1050	131	314.	*	1	1705	206	2.	*	1	2320	281	0.
1	0440	57	1199.	*	1	1055	132	294.	*	1	1710	207	2.	*	1	2325	282	0.
1	0445	58	1249.	*	1	1100	133	276.	*	1	1715	208	2.	*	1	2330	283	0.
1	0450	59	1284.	*	1	1105	134	260.	*	1	1720	209	1.	*	1	2335	284	0.
1	0455	60	1322.	*	1	1110	135	245.	*	1	1725	210	1.	*	1	2340	285	0.
1	0500	61	1383.	*	1	1115	136	230.	*	1	1730	211	1.	*	1	2345	286	0.
1	0505	62	1450.	*	1	1120	137	216.	*	1	1735	212	1.	*	1	2350	287	0.
1	0510	63	1517.	*	1	1125	138	199.	*	1	1740	213	1.	*	1	2355	288	0.
1	0515	64	1581.	*	1	1130	139	179.	*	1	1745	214	1.	*	2	0000	289	0.
1	0520	65	1634.	*	1	1135	140	161.	*	1	1750	215	1.	*	2	0005	290	0.
1	0525	66	1673.	*	1	1140	141	146.	*	1	1755	216	1.	*	2	0010	291	0.
1	0530	67	1698.	*	1	1145	142	132.	*	1	1800	217	1.	*	2	0015	292	0.
1	0535	68	1726.	*	1	1150	143	119.	*	1	1805	218	1.	*	2	0020	293	0.
1	0540	69	1766.	*	1	1155	144	108.	*	1	1810	219	1.	*	2	0025	294	0.
1	0545	70	1802.	*	1	1200	145	99.	*	1	1815	220	1.	*	2	0030	295	0.
1	0550	71	1809.	*	1	1205	146	91.	*	1	1820	221	1.	*	2	0035	296	0.
1	0555	72	1801.	*	1	1210	147	85.	*	1	1825	222	1.	*	2	0040	297	0.
1	0600	73	1795.	*	1	1215	148	78.	*	1	1830	223	1.	*	2	0045	298	0.
1	0605	74	1782.	*	1	1220	149	73.	*	1	1835	224	1.	*	2	0050	299	0.
1	0610	75	1763.	*	1	1225	150	68.	*	1	1840	225	0.	*	2	0055	300	0.

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PEAK FLOW (CFS)	TIME (HR)	MAXIMUM AVERAGE FLOW (CFS)	6-HR	24-HR	72-HR	24.92-HR
+ 1809.	5.83		1285.	355.	342.	342.
		(INCHES)	.134	.149	.149	.149
		(AC-FT)	637.	705.	705.	705.

CUMULATIVE AREA = 88.86 SQ MI

COMPUTED MUSKINGUM-CUNGE PARAMETERS

ELEMENT	ALPHA	M	COMPUTATION TIME STEP DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	.08	1.64	5.00	375.00	284.79	350.00	.02	2.44
			INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL					
MAIN	.08	1.64	5.00		284.79	350.00	.02	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1021E+03 EXCESS= .0000E+00 OUTFLOW= .1021E+03 BASIN STORAGE= .2644E-01 PERCENT ERROR= .0

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HYDROGRAPH AT STATION FINISH
PLAN 1, RATIO = .26

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DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	253.	1		1230	151	37.	1		1845	226	2.
1		0005	2	0.	1		0620	77	248.	1		1235	152	36.	1		1850	227	2.
1		0010	3	0.	1		0625	78	242.	1		1240	153	35.	1		1855	228	2.
1		0015	4	0.	1		0630	79	240.	1		1245	154	34.	1		1900	229	2.
1		0020	5	0.	1		0635	80	235.	1		1250	155	33.	1		1905	230	2.
1		0025	6	0.	1		0640	81	229.	1		1255	156	32.	1		1910	231	2.
1		0030	7	0.	1		0645	82	221.	1		1300	157	31.	1		1915	232	2.
1		0035	8	0.	1		0650	83	211.	1		1305	158	30.	1		1920	233	2.
1		0040	9	0.	1		0655	84	200.	1		1310	159	29.	1		1925	234	2.
1		0045	10	0.	1		0700	85	190.	1		1315	160	28.	1		1930	235	1.
1		0050	11	0.	1		0705	86	179.	1		1320	161	27.	1		1935	236	1.
1		0055	12	0.	1		0710	87	168.	1		1325	162	26.	1		1940	237	1.
1		0100	13	0.	1		0715	88	158.	1		1330	163	26.	1		1945	238	1.
1		0105	14	0.	1		0720	89	148.	1		1335	164	25.	1		1950	239	1.

1	0110	15	0.	*	1	0725	90	139.	*	1	1340	165	24.	*	1	1955	240	1.
1	0115	16	0.	*	1	0730	91	130.	*	1	1345	166	23.	*	1	2000	241	1.
1	0120	17	0.	*	1	0735	92	122.	*	1	1350	167	23.	*	1	2005	242	1.
1	0125	18	0.	*	1	0740	93	115.	*	1	1355	168	22.	*	1	2010	243	1.
1	0130	19	0.	*	1	0745	94	110.	*	1	1400	169	22.	*	1	2015	244	1.
1	0135	20	0.	*	1	0750	95	109.	*	1	1405	170	21.	*	1	2020	245	1.
1	0140	21	0.	*	1	0755	96	120.	*	1	1410	171	20.	*	1	2025	246	1.
1	0145	22	0.	*	1	0800	97	151.	*	1	1415	172	20.	*	1	2030	247	1.
1	0150	23	0.	*	1	0805	98	183.	*	1	1420	173	19.	*	1	2035	248	1.
1	0155	24	0.	*	1	0810	99	186.	*	1	1425	174	19.	*	1	2040	249	1.
1	0200	25	0.	*	1	0815	100	180.	*	1	1430	175	18.	*	1	2045	250	1.
1	0205	26	0.	*	1	0820	101	193.	*	1	1435	176	18.	*	1	2050	251	1.
1	0210	27	0.	*	1	0825	102	200.	*	1	1440	177	17.	*	1	2055	252	1.
1	0215	28	0.	*	1	0830	103	189.	*	1	1445	178	17.	*	1	2100	253	1.
1	0220	29	0.	*	1	0835	104	185.	*	1	1450	179	16.	*	1	2105	254	1.
1	0225	30	0.	*	1	0840	105	186.	*	1	1455	180	16.	*	1	2110	255	1.
1	0230	31	0.	*	1	0845	106	176.	*	1	1500	181	15.	*	1	2115	256	1.
1	0235	32	0.	*	1	0850	107	166.	*	1	1505	182	15.	*	1	2120	257	1.
1	0240	33	0.	*	1	0855	108	161.	*	1	1510	183	14.	*	1	2125	258	0.
1	0245	34	0.	*	1	0900	109	154.	*	1	1515	184	14.	*	1	2130	259	0.
1	0250	35	0.	*	1	0905	110	148.	*	1	1520	185	14.	*	1	2135	260	0.
1	0255	36	0.	*	1	0910	111	145.	*	1	1525	186	13.	*	1	2140	261	0.
1	0300	37	0.	*	1	0915	112	141.	*	1	1530	187	13.	*	1	2145	262	0.
1	0305	38	0.	*	1	0920	113	137.	*	1	1535	188	12.	*	1	2150	263	0.
1	0310	39	0.	*	1	0925	114	131.	*	1	1540	189	12.	*	1	2155	264	0.
1	0315	40	0.	*	1	0930	115	127.	*	1	1545	190	11.	*	1	2200	265	0.
1	0320	41	0.	*	1	0935	116	124.	*	1	1550	191	11.	*	1	2205	266	0.
1	0325	42	0.	*	1	0940	117	121.	*	1	1555	192	10.	*	1	2210	267	0.
1	0330	43	0.	*	1	0945	118	119.	*	1	1600	193	10.	*	1	2215	268	0.
1	0335	44	0.	*	1	0950	119	117.	*	1	1605	194	10.	*	1	2220	269	0.
1	0340	45	0.	*	1	0955	120	115.	*	1	1610	195	9.	*	1	2225	270	0.
1	0345	46	0.	*	1	1000	121	113.	*	1	1615	196	9.	*	1	2230	271	0.
1	0350	47	0.	*	1	1005	122	109.	*	1	1620	197	8.	*	1	2235	272	0.
1	0355	48	1.	*	1	1010	123	106.	*	1	1625	198	8.	*	1	2240	273	0.
1	0400	49	3.	*	1	1015	124	101.	*	1	1630	199	8.	*	1	2245	274	0.
1	0405	50	7.	*	1	1020	125	96.	*	1	1635	200	8.	*	1	2250	275	0.
1	0410	51	12.	*	1	1025	126	93.	*	1	1640	201	7.	*	1	2255	276	0.
1	0415	52	19.	*	1	1030	127	91.	*	1	1645	202	7.	*	1	2300	277	0.
1	0420	53	31.	*	1	1035	128	89.	*	1	1650	203	7.	*	1	2305	278	0.
1	0425	54	45.	*	1	1040	129	86.	*	1	1655	204	6.	*	1	2310	279	0.
1	0430	55	61.	*	1	1045	130	83.	*	1	1700	205	6.	*	1	2315	280	0.
1	0435	56	79.	*	1	1050	131	79.	*	1	1705	206	6.	*	1	2320	281	0.
1	0440	57	95.	*	1	1055	132	75.	*	1	1710	207	6.	*	1	2325	282	0.
1	0445	58	103.	*	1	1100	133	72.	*	1	1715	208	5.	*	1	2330	283	0.
1	0450	59	112.	*	1	1105	134	70.	*	1	1720	209	5.	*	1	2335	284	0.
1	0455	60	119.	*	1	1110	135	67.	*	1	1725	210	5.	*	1	2340	285	0.
1	0500	61	126.	*	1	1115	136	65.	*	1	1730	211	5.	*	1	2345	286	0.
1	0505	62	136.	*	1	1120	137	62.	*	1	1735	212	5.	*	1	2350	287	0.
1	0510	63	149.	*	1	1125	138	59.	*	1	1740	213	4.	*	1	2355	288	0.
1	0515	64	166.	*	1	1130	139	57.	*	1	1745	214	4.	*	2	0000	289	0.
1	0520	65	187.	*	1	1135	140	55.	*	1	1750	215	4.	*	2	0005	290	0.
1	0525	66	215.	*	1	1140	141	53.	*	1	1755	216	4.	*	2	0010	291	0.
1	0530	67	248.	*	1	1145	142	51.	*	1	1800	217	4.	*	2	0015	292	0.
1	0535	68	273.	*	1	1150	143	49.	*	1	1805	218	3.	*	2	0020	293	0.
1	0540	69	279.	*	1	1155	144	47.	*	1	1810	219	3.	*	2	0025	294	0.
1	0545	70	280.	*	1	1200	145	46.	*	1	1815	220	3.	*	2	0030	295	0.
1	0550	71	285.	*	1	1205	146	44.	*	1	1820	221	3.	*	2	0035	296	0.
1	0555	72	283.	*	1	1210	147	43.	*	1	1825	222	3.	*	2	0040	297	0.
1	0600	73	275.	*	1	1215	148	41.	*	1	1830	223	3.	*	2	0045	298	0.
1	0605	74	268.	*	1	1220	149	40.	*	1	1835	224	3.	*	2	0050	299	0.
1	0610	75	260.	*	1	1225	150	38.	*	1	1840	225	2.	*	2	0055	300	0.
				*					*					*				

****

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 285.	5.83		169.	51.	50.	50.
		(INCHES)	.018	.022	.022	.022
		(AC-FT)	84.	102.	102.	102.

CUMULATIVE AREA = 88.86 SQ MI

```
1****************************************                                                    ****************************************
 *                                      *                                                    *                                      *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *                                                    *    U.S. ARMY CORPS OF ENGINEERS      *
 *               JUN   1998             *                                                    *    HYDROLOGIC ENGINEERING CENTER     *
 *            VERSION 4.1               *                                                    *          609 SECOND STREET           *
 *                                      *                                                    *       DAVIS, CALIFORNIA 95616        *
 *  RUN DATE   18MAR08  TIME  14:48:35  *                                                    *           (916) 756-1104             *
 *                                      *                                                    *                                      *
 ****************************************                                                    ****************************************
```

```
X     X  XXXXXXX   XXXXX           X
X     X  X        X     X         XX
X     X  X        X                X
XXXXXXX  XXXX     X        XXXXX   X
X     X  X        X                X
X     X  X        X     X          X
X     X  XXXXXXX   XXXXX          XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM


```
          LINE           ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 *** FREE ***
 *** NOLIST ***
1****************************************                                                    ****************************************
 *                                      *                                                    *                                      *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *                                                    *    U.S. ARMY CORPS OF ENGINEERS      *
 *               JUN   1998             *                                                    *    HYDROLOGIC ENGINEERING CENTER     *
 *            VERSION 4.1               *                                                    *          609 SECOND STREET           *
 *                                      *                                                    *       DAVIS, CALIFORNIA 95616        *
 *  RUN DATE   18MAR08  TIME  14:48:35  *                                                    *           (916) 756-1104             *
 *                                      *                                                    *                                      *
 ****************************************                                                    ****************************************
```

KLEINFELDER
FEBRUARY 2008
ALTERNATIVE C

DESIGN STORM = 100-YEAR 6-HOUR STORM
STORM DISTRIBUTION = SDN5

```
  10 IO          OUTPUT CONTROL VARIABLES
                       IPRNT           5  PRINT CONTROL
                       IPLOT           0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE

     IT          HYDROGRAPH TIME DATA
                        NMIN           5  MINUTES IN COMPUTATION INTERVAL
                       IDATE      1    0  STARTING DATE
                       ITIME        0000  STARTING TIME
                          NQ         300  NUMBER OF HYDROGRAPH ORDINATES
                      NDDATE      2    0  ENDING DATE
                      NDTIME        0055  ENDING TIME
                      ICENT           19  CENTURY MARK

                  COMPUTATION INTERVAL     .08 HOURS
                       TOTAL TIME BASE   24.92 HOURS

          ENGLISH UNITS
```

```
              DRAINAGE AREA         SQUARE MILES
              PRECIPITATION DEPTH   INCHES
              LENGTH, ELEVATION     FEET
              FLOW                  CUBIC FEET PER SECOND
              STORAGE VOLUME        ACRE-FEET
              SURFACE AREA          ACRES
              TEMPERATURE           DEGREES FAHRENHEIT

     JP          MULTI-PLAN OPTION
                       NPLAN           1  NUMBER OF PLANS

     JR          MULTI-RATIO OPTION
                     RATIOS OF PRECIPITATION
                    1.00       .87       .74       .57       .44       .26


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


            **************
            *            *
1250 KK     *     ULWIN  *
            *            *
            **************

1254 KO          OUTPUT CONTROL VARIABLES
                       IPRNT           1  PRINT CONTROL
                       IPLOT           0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE

1253 HC          HYDROGRAPH COMBINATION
                       ICOMP           4  NUMBER OF HYDROGRAPHS TO COMBINE

                                                                  ***
*****************************************************************************************************************************************

                                                HYDROGRAPH AT STATION    ULWIN
                                                     SUM OF  4 HYDROGRAPHS
                                                    PLAN 1,   RATIO =  1.00
*****************************************************************************************************************************************
```

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	8098.	1		1230	151	4.	1		1845	226	0.
1		0005	2	0.	1		0620	77	7401.	1		1235	152	4.	1		1850	227	0.
1		0010	3	0.	1		0625	78	6763.	1		1240	153	3.	1		1855	228	0.
1		0015	4	0.	1		0630	79	6185.	1		1245	154	3.	1		1900	229	0.
1		0020	5	0.	1		0635	80	5663.	1		1250	155	3.	1		1905	230	0.
1		0025	6	0.	1		0640	81	5198.	1		1255	156	2.	1		1910	231	0.
1		0030	7	0.	1		0645	82	4780.	1		1300	157	2.	1		1915	232	0.
1		0035	8	0.	1		0650	83	4397.	1		1305	158	2.	1		1920	233	0.
1		0040	9	0.	1		0655	84	4045.	1		1310	159	1.	1		1925	234	0.
1		0045	10	0.	1		0700	85	3724.	1		1315	160	1.	1		1930	235	0.
1		0050	11	1.	1		0705	86	3428.	1		1320	161	1.	1		1935	236	0.
1		0055	12	2.	1		0710	87	3153.	1		1325	162	1.	1		1940	237	0.
1		0100	13	4.	1		0715	88	2896.	1		1330	163	1.	1		1945	238	0.
1		0105	14	6.	1		0720	89	2659.	1		1335	164	1.	1		1950	239	0.
1		0110	15	9.	1		0725	90	2437.	1		1340	165	1.	1		1955	240	0.
1		0115	16	12.	1		0730	91	2232.	1		1345	166	0.	1		2000	241	0.
1		0120	17	16.	1		0735	92	2043.	1		1350	167	0.	1		2005	242	0.
1		0125	18	20.	1		0740	93	1869.	1		1355	168	0.	1		2010	243	0.
1		0130	19	25.	1		0745	94	1709.	1		1400	169	0.	1		2015	244	0.
1		0135	20	31.	1		0750	95	1562.	1		1405	170	0.	1		2020	245	0.
1		0140	21	38.	1		0755	96	1428.	1		1410	171	0.	1		2025	246	0.
1		0145	22	47.	1		0800	97	1308.	1		1415	172	0.	1		2030	247	0.
1		0150	23	57.	1		0805	98	1200.	1		1420	173	0.	1		2035	248	0.
1		0155	24	69.	1		0810	99	1102.	1		1425	174	0.	1		2040	249	0.
1		0200	25	86.	1		0815	100	1010.	1		1430	175	0.	1		2045	250	0.
1		0205	26	109.	1		0820	101	920.	1		1435	176	0.	1		2050	251	0.
1		0210	27	141.	1		0825	102	837.	1		1440	177	0.	1		2055	252	0.
1		0215	28	181.	1		0830	103	760.	1		1445	178	0.	1		2100	253	0.
1		0220	29	227.	1		0835	104	689.	1		1450	179	0.	1		2105	254	0.
1		0225	30	276.	1		0840	105	624.	1		1455	180	0.	1		2110	255	0.
1		0230	31	324.	1		0845	106	564.	1		1500	181	0.	1		2115	256	0.
1		0235	32	372.	1		0850	107	511.	1		1505	182	0.	1		2120	257	0.
1		0240	33	422.	1		0855	108	462.	1		1510	183	0.	1		2125	258	0.
1		0245	34	476.	1		0900	109	419.	1		1515	184	0.	1		2130	259	0.
1		0250	35	536.	1		0905	110	381.	1		1520	185	0.	1		2135	260	0.

1	0255	36	606.	*	1	0910	111	346.	*	1	1525	186	0.	*	1	2140	261	0.
1	0300	37	690.	*	1	0915	112	315.	*	1	1530	187	0.	*	1	2145	262	0.
1	0305	38	788.	*	1	0920	113	287.	*	1	1535	188	0.	*	1	2150	263	0.
1	0310	39	903.	*	1	0925	114	262.	*	1	1540	189	0.	*	1	2155	264	0.
1	0315	40	1038.	*	1	0930	115	239.	*	1	1545	190	0.	*	1	2200	265	0.
1	0320	41	1198.	*	1	0935	116	218.	*	1	1550	191	0.	*	1	2205	266	0.
1	0325	42	1394.	*	1	0940	117	198.	*	1	1555	192	0.	*	1	2210	267	0.
1	0330	43	1646.	*	1	0945	118	180.	*	1	1600	193	0.	*	1	2215	268	0.
1	0335	44	1978.	*	1	0950	119	163.	*	1	1605	194	0.	*	1	2220	269	0.
1	0340	45	2407.	*	1	0955	120	148.	*	1	1610	195	0.	*	1	2225	270	0.
1	0345	46	2918.	*	1	1000	121	134.	*	1	1615	196	0.	*	1	2230	271	0.
1	0350	47	3491.	*	1	1005	122	121.	*	1	1620	197	0.	*	1	2235	272	0.
1	0355	48	4159.	*	1	1010	123	109.	*	1	1625	198	0.	*	1	2240	273	0.
1	0400	49	5233.	*	1	1015	124	99.	*	1	1630	199	0.	*	1	2245	274	0.
1	0405	50	7375.	*	1	1020	125	89.	*	1	1635	200	0.	*	1	2250	275	0.
1	0410	51	10320.	*	1	1025	126	80.	*	1	1640	201	0.	*	1	2255	276	0.
1	0415	52	12806.	*	1	1030	127	72.	*	1	1645	202	0.	*	1	2300	277	0.
1	0420	53	14518.	*	1	1035	128	65.	*	1	1650	203	0.	*	1	2305	278	0.
1	0425	54	15537.	*	1	1040	129	58.	*	1	1655	204	0.	*	1	2310	279	0.
1	0430	55	15961.	*	1	1045	130	52.	*	1	1700	205	0.	*	1	2315	280	0.
1	0435	56	15919.	*	1	1050	131	47.	*	1	1705	206	0.	*	1	2320	281	0.
1	0440	57	15522.	*	1	1055	132	42.	*	1	1710	207	0.	*	1	2325	282	0.
1	0445	58	14925.	*	1	1100	133	38.	*	1	1715	208	0.	*	1	2330	283	0.
1	0450	59	14233.	*	1	1105	134	34.	*	1	1720	209	0.	*	1	2335	284	0.
1	0455	60	13555.	*	1	1110	135	30.	*	1	1725	210	0.	*	1	2340	285	0.
1	0500	61	12996.	*	1	1115	136	27.	*	1	1730	211	0.	*	1	2345	286	0.
1	0505	62	12592.	*	1	1120	137	24.	*	1	1735	212	0.	*	1	2350	287	0.
1	0510	63	12348.	*	1	1125	138	21.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	12257.	*	1	1130	139	19.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	12293.	*	1	1135	140	17.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	12426.	*	1	1140	141	15.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	12593.	*	1	1145	142	14.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	12683.	*	1	1150	143	12.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	12592.	*	1	1155	144	11.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	12284.	*	1	1200	145	10.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	11777.	*	1	1205	146	8.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	11130.	*	1	1210	147	7.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	10396.	*	1	1215	148	7.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	9618.	*	1	1220	149	6.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	8842.	*	1	1225	150	5.	*	1	1840	225	0.	*	2	0055	300	0.

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 15961.	4.50		6210.	1582.	1524.	1524.
		(INCHES)	.981	1.000	1.000	1.000
		(AC-FT)	3080.	3137.	3137.	3137.

CUMULATIVE AREA = 58.84 SQ MI

****

HYDROGRAPH AT STATION ULWIN
SUM OF 4 HYDROGRAPHS
PLAN 1, RATIO = .87

****

DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	*	1		0615	76	6787.	*	1		1230	151	6.	*	1		1845	226	0.
1		0005	2	0.	*	1		0620	77	6228.	*	1		1235	152	6.	*	1		1850	227	0.
1		0010	3	0.	*	1		0625	78	5707.	*	1		1240	153	5.	*	1		1855	228	0.
1		0015	4	0.	*	1		0630	79	5234.	*	1		1245	154	4.	*	1		1900	229	0.
1		0020	5	0.	*	1		0635	80	4804.	*	1		1250	155	4.	*	1		1905	230	0.
1		0025	6	0.	*	1		0640	81	4414.	*	1		1255	156	3.	*	1		1910	231	0.
1		0030	7	0.	*	1		0645	82	4059.	*	1		1300	157	3.	*	1		1915	232	0.
1		0035	8	0.	*	1		0650	83	3737.	*	1		1305	158	3.	*	1		1920	233	0.
1		0040	9	0.	*	1		0655	84	3444.	*	1		1310	159	2.	*	1		1925	234	0.
1		0045	10	0.	*	1		0700	85	3178.	*	1		1315	160	2.	*	1		1930	235	0.
1		0050	11	0.	*	1		0705	86	2934.	*	1		1320	161	2.	*	1		1935	236	0.
1		0055	12	0.	*	1		0710	87	2708.	*	1		1325	162	2.	*	1		1940	237	0.
1		0100	13	0.	*	1		0715	88	2497.	*	1		1330	163	1.	*	1		1945	238	0.
1		0105	14	1.	*	1		0720	89	2302.	*	1		1335	164	1.	*	1		1950	239	0.
1		0110	15	1.	*	1		0725	90	2120.	*	1		1340	165	1.	*	1		1955	240	0.
1		0115	16	2.	*	1		0730	91	1951.	*	1		1345	166	1.	*	1		2000	241	0.
1		0120	17	3.	*	1		0735	92	1795.	*	1		1350	167	1.	*	1		2005	242	0.

1	0125	18	4.	*	1	0740	93	1650.	*	1	1355	168	1.	*	1	2010	243	0.
1	0130	19	6.	*	1	0745	94	1518.	*	1	1400	169	1.	*	1	2015	244	0.
1	0135	20	8.	*	1	0750	95	1396.	*	1	1405	170	1.	*	1	2020	245	0.
1	0140	21	11.	*	1	0755	96	1284.	*	1	1410	171	0.	*	1	2025	246	0.
1	0145	22	15.	*	1	0800	97	1182.	*	1	1415	172	0.	*	1	2030	247	0.
1	0150	23	19.	*	1	0805	98	1089.	*	1	1420	173	0.	*	1	2035	248	0.
1	0155	24	25.	*	1	0810	99	1002.	*	1	1425	174	0.	*	1	2040	249	0.
1	0200	25	33.	*	1	0815	100	919.	*	1	1430	175	0.	*	1	2045	250	0.
1	0205	26	43.	*	1	0820	101	843.	*	1	1435	176	0.	*	1	2050	251	0.
1	0210	27	55.	*	1	0825	102	774.	*	1	1440	177	0.	*	1	2055	252	0.
1	0215	28	70.	*	1	0830	103	710.	*	1	1445	178	0.	*	1	2100	253	0.
1	0220	29	87.	*	1	0835	104	650.	*	1	1450	179	0.	*	1	2105	254	0.
1	0225	30	108.	*	1	0840	105	594.	*	1	1455	180	0.	*	1	2110	255	0.
1	0230	31	133.	*	1	0845	106	541.	*	1	1500	181	0.	*	1	2115	256	0.
1	0235	32	159.	*	1	0850	107	491.	*	1	1505	182	0.	*	1	2120	257	0.
1	0240	33	186.	*	1	0855	108	446.	*	1	1510	183	0.	*	1	2125	258	0.
1	0245	34	214.	*	1	0900	109	405.	*	1	1515	184	0.	*	1	2130	259	0.
1	0250	35	242.	*	1	0905	110	368.	*	1	1520	185	0.	*	1	2135	260	0.
1	0255	36	272.	*	1	0910	111	334.	*	1	1525	186	0.	*	1	2140	261	0.
1	0300	37	307.	*	1	0915	112	304.	*	1	1530	187	0.	*	1	2145	262	0.
1	0305	38	352.	*	1	0920	113	277.	*	1	1535	188	0.	*	1	2150	263	0.
1	0310	39	415.	*	1	0925	114	253.	*	1	1540	189	0.	*	1	2155	264	0.
1	0315	40	500.	*	1	0930	115	231.	*	1	1545	190	0.	*	1	2200	265	0.
1	0320	41	611.	*	1	0935	116	212.	*	1	1550	191	0.	*	1	2205	266	0.
1	0325	42	750.	*	1	0940	117	194.	*	1	1555	192	0.	*	1	2210	267	0.
1	0330	43	928.	*	1	0945	118	178.	*	1	1600	193	0.	*	1	2215	268	0.
1	0335	44	1165.	*	1	0950	119	163.	*	1	1605	194	0.	*	1	2220	269	0.
1	0340	45	1480.	*	1	0955	120	150.	*	1	1610	195	0.	*	1	2225	270	0.
1	0345	46	1865.	*	1	1000	121	137.	*	1	1615	196	0.	*	1	2230	271	0.
1	0350	47	2288.	*	1	1005	122	126.	*	1	1620	197	0.	*	1	2235	272	0.
1	0355	48	2718.	*	1	1010	123	116.	*	1	1625	198	0.	*	1	2240	273	0.
1	0400	49	3113.	*	1	1015	124	106.	*	1	1630	199	0.	*	1	2245	274	0.
1	0405	50	3644.	*	1	1020	125	97.	*	1	1635	200	0.	*	1	2250	275	0.
1	0410	51	5292.	*	1	1025	126	89.	*	1	1640	201	0.	*	1	2255	276	0.
1	0415	52	7899.	*	1	1030	127	82.	*	1	1645	202	0.	*	1	2300	277	0.
1	0420	53	9808.	*	1	1035	128	75.	*	1	1650	203	0.	*	1	2305	278	0.
1	0425	54	10925.	*	1	1040	129	68.	*	1	1655	204	0.	*	1	2310	279	0.
1	0430	55	11492.	*	1	1045	130	62.	*	1	1700	205	0.	*	1	2315	280	0.
1	0435	56	11648.	*	1	1050	131	56.	*	1	1705	206	0.	*	1	2320	281	0.
1	0440	57	11629.	*	1	1055	132	51.	*	1	1710	207	0.	*	1	2325	282	0.
1	0445	58	11439.	*	1	1100	133	46.	*	1	1715	208	0.	*	1	2330	283	0.
1	0450	59	11083.	*	1	1105	134	42.	*	1	1720	209	0.	*	1	2335	284	0.
1	0455	60	10643.	*	1	1110	135	38.	*	1	1725	210	0.	*	1	2340	285	0.
1	0500	61	10205.	*	1	1115	136	34.	*	1	1730	211	0.	*	1	2345	286	0.
1	0505	62	9848.	*	1	1120	137	31.	*	1	1735	212	0.	*	1	2350	287	0.
1	0510	63	9614.	*	1	1125	138	27.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	9506.	*	1	1130	139	25.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	9508.	*	1	1135	140	22.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	9596.	*	1	1140	141	20.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	9743.	*	1	1145	142	18.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	9893.	*	1	1150	143	16.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	9944.	*	1	1155	144	14.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	9816.	*	1	1200	145	13.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	9503.	*	1	1205	146	11.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	9057.	*	1	1210	147	10.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	8534.	*	1	1215	148	9.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	7963.	*	1	1220	149	8.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	7373.	*	1	1225	150	7.	*	1	1840	225	0.	*	2	0055	300	0.

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PEAK FLOW (CFS)	TIME (HR)	MAXIMUM AVERAGE FLOW (CFS) 6-HR	24-HR	72-HR	24.92-HR
+ 11648.	4.58	4739.	1206.	1162.	1162.
		(INCHES) .749	.762	.762	.762
		(AC-FT) 2350.	2392.	2392.	2392.

CUMULATIVE AREA = 58.84 SQ MI

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HYDROGRAPH AT STATION ULWIN
SUM OF 4 HYDROGRAPHS
PLAN 1, RATIO = .74

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DA MON HRMN	ORD	FLOW	*	DA MON HRMN	ORD	FLOW	*	DA MON HRMN	ORD	FLOW	*	DA MON HRMN	ORD	FLOW

1	0000	1	0.	*	1	0615	76	5429.	*	1	1230	151	9.	*	1	1845	226	0.
1	0005	2	0.	*	1	0620	77	5020.	*	1	1235	152	8.	*	1	1850	227	0.
1	0010	3	0.	*	1	0625	78	4624.	*	1	1240	153	7.	*	1	1855	228	0.
1	0015	4	0.	*	1	0630	79	4253.	*	1	1245	154	6.	*	1	1900	229	0.
1	0020	5	0.	*	1	0635	80	3912.	*	1	1250	155	6.	*	1	1905	230	0.
1	0025	6	0.	*	1	0640	81	3599.	*	1	1255	156	5.	*	1	1910	231	0.
1	0030	7	0.	*	1	0645	82	3317.	*	1	1300	157	5.	*	1	1915	232	0.
1	0035	8	0.	*	1	0650	83	3060.	*	1	1305	158	4.	*	1	1920	233	0.
1	0040	9	0.	*	1	0655	84	2826.	*	1	1310	159	4.	*	1	1925	234	0.
1	0045	10	0.	*	1	0700	85	2612.	*	1	1315	160	3.	*	1	1930	235	0.
1	0050	11	0.	*	1	0705	86	2415.	*	1	1320	161	3.	*	1	1935	236	0.
1	0055	12	0.	*	1	0710	87	2235.	*	1	1325	162	2.	*	1	1940	237	0.
1	0100	13	0.	*	1	0715	88	2070.	*	1	1330	163	2.	*	1	1945	238	0.
1	0105	14	0.	*	1	0720	89	1917.	*	1	1335	164	2.	*	1	1950	239	0.
1	0110	15	0.	*	1	0725	90	1773.	*	1	1340	165	2.	*	1	1955	240	0.
1	0115	16	0.	*	1	0730	91	1641.	*	1	1345	166	2.	*	1	2000	241	0.
1	0120	17	0.	*	1	0735	92	1519.	*	1	1350	167	1.	*	1	2005	242	0.
1	0125	18	0.	*	1	0740	93	1404.	*	1	1355	168	1.	*	1	2010	243	0.
1	0130	19	0.	*	1	0745	94	1298.	*	1	1400	169	1.	*	1	2015	244	0.
1	0135	20	1.	*	1	0750	95	1200.	*	1	1405	170	1.	*	1	2020	245	0.
1	0140	21	1.	*	1	0755	96	1108.	*	1	1410	171	1.	*	1	2025	246	0.
1	0145	22	2.	*	1	0800	97	1024.	*	1	1415	172	1.	*	1	2030	247	0.
1	0150	23	4.	*	1	0805	98	945.	*	1	1420	173	1.	*	1	2035	248	0.
1	0155	24	6.	*	1	0810	99	871.	*	1	1425	174	1.	*	1	2040	249	0.
1	0200	25	9.	*	1	0815	100	803.	*	1	1430	175	0.	*	1	2045	250	0.
1	0205	26	12.	*	1	0820	101	741.	*	1	1435	176	0.	*	1	2050	251	0.
1	0210	27	17.	*	1	0825	102	684.	*	1	1440	177	0.	*	1	2055	252	0.
1	0215	28	22.	*	1	0830	103	632.	*	1	1445	178	0.	*	1	2100	253	0.
1	0220	29	30.	*	1	0835	104	585.	*	1	1450	179	0.	*	1	2105	254	0.
1	0225	30	38.	*	1	0840	105	542.	*	1	1455	180	0.	*	1	2110	255	0.
1	0230	31	47.	*	1	0845	106	501.	*	1	1500	181	0.	*	1	2115	256	0.
1	0235	32	57.	*	1	0850	107	463.	*	1	1505	182	0.	*	1	2120	257	0.
1	0240	33	67.	*	1	0855	108	428.	*	1	1510	183	0.	*	1	2125	258	0.
1	0245	34	77.	*	1	0900	109	395.	*	1	1515	184	0.	*	1	2130	259	0.
1	0250	35	87.	*	1	0905	110	363.	*	1	1520	185	0.	*	1	2135	260	0.
1	0255	36	99.	*	1	0910	111	332.	*	1	1525	186	0.	*	1	2140	261	0.
1	0300	37	112.	*	1	0915	112	303.	*	1	1530	187	0.	*	1	2145	262	0.
1	0305	38	128.	*	1	0920	113	277.	*	1	1535	188	0.	*	1	2150	263	0.
1	0310	39	148.	*	1	0925	114	253.	*	1	1540	189	0.	*	1	2155	264	0.
1	0315	40	176.	*	1	0930	115	231.	*	1	1545	190	0.	*	1	2200	265	0.
1	0320	41	219.	*	1	0935	116	212.	*	1	1550	191	0.	*	1	2205	266	0.
1	0325	42	282.	*	1	0940	117	194.	*	1	1555	192	0.	*	1	2210	267	0.
1	0330	43	375.	*	1	0945	118	179.	*	1	1600	193	0.	*	1	2215	268	0.
1	0335	44	507.	*	1	0950	119	164.	*	1	1605	194	0.	*	1	2220	269	0.
1	0340	45	699.	*	1	0955	120	151.	*	1	1610	195	0.	*	1	2225	270	0.
1	0345	46	959.	*	1	1000	121	139.	*	1	1615	196	0.	*	1	2230	271	0.
1	0350	47	1265.	*	1	1005	122	128.	*	1	1620	197	0.	*	1	2235	272	0.
1	0355	48	1589.	*	1	1010	123	118.	*	1	1625	198	0.	*	1	2240	273	0.
1	0400	49	1889.	*	1	1015	124	109.	*	1	1630	199	0.	*	1	2245	274	0.
1	0405	50	2130.	*	1	1020	125	101.	*	1	1635	200	0.	*	1	2250	275	0.
1	0410	51	2323.	*	1	1025	126	93.	*	1	1640	201	0.	*	1	2255	276	0.
1	0415	52	2713.	*	1	1030	127	85.	*	1	1645	202	0.	*	1	2300	277	0.
1	0420	53	4510.	*	1	1035	128	79.	*	1	1650	203	0.	*	1	2305	278	0.
1	0425	54	6868.	*	1	1040	129	72.	*	1	1655	204	0.	*	1	2310	279	0.
1	0430	55	7439.	*	1	1045	130	66.	*	1	1700	205	0.	*	1	2315	280	0.
1	0435	56	7803.	*	1	1050	131	61.	*	1	1705	206	0.	*	1	2320	281	0.
1	0440	57	7919.	*	1	1055	132	56.	*	1	1710	207	0.	*	1	2325	282	0.
1	0445	58	7852.	*	1	1100	133	51.	*	1	1715	208	0.	*	1	2330	283	0.
1	0450	59	7791.	*	1	1105	134	46.	*	1	1720	209	0.	*	1	2335	284	0.
1	0455	60	7639.	*	1	1110	135	42.	*	1	1725	210	0.	*	1	2340	285	0.
1	0500	61	7474.	*	1	1115	136	38.	*	1	1730	211	0.	*	1	2345	286	0.
1	0505	62	7265.	*	1	1120	137	35.	*	1	1735	212	0.	*	1	2350	287	0.
1	0510	63	7067.	*	1	1125	138	32.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	6920.	*	1	1130	139	29.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	6863.	*	1	1135	140	26.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	6883.	*	1	1140	141	24.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	6969.	*	1	1145	142	21.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	7092.	*	1	1150	143	19.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	7207.	*	1	1155	144	18.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	7241.	*	1	1200	145	16.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	7149.	*	1	1205	146	14.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	6932.	*	1	1210	147	13.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	6623.	*	1	1215	148	12.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	6252.	*	1	1220	149	11.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	5846.	*	1	1225	150	10.	*	1	1840	225	0.	*	2	0055	300	0.

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PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.92-HR

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+   (CFS)       (HR)
                          (CFS)
+    7919.      4.67                 3381.        861.        829.         829.
                         (INCHES)      .534        .544        .544         .544
                          (AC-FT)     1677.       1707.       1707.        1707.

                         CUMULATIVE AREA =   58.84 SQ MI
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HYDROGRAPH AT STATION ULWIN
SUM OF 4 HYDROGRAPHS
PLAN 1, RATIO = .57

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DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	3453.	1		1230	151	15.	1		1845	226	0.
1		0005	2	0.	1		0620	77	3264.	1		1235	152	14.	1		1850	227	0.
1		0010	3	0.	1		0625	78	3076.	1		1240	153	12.	1		1855	228	0.
1		0015	4	0.	1		0630	79	2887.	1		1245	154	11.	1		1900	229	0.
1		0020	5	0.	1		0635	80	2696.	1		1250	155	11.	1		1905	230	0.
1		0025	6	0.	1		0640	81	2505.	1		1255	156	10.	1		1910	231	0.
1		0030	7	0.	1		0645	82	2322.	1		1300	157	9.	1		1915	232	0.
1		0035	8	0.	1		0650	83	2149.	1		1305	158	8.	1		1920	233	0.
1		0040	9	0.	1		0655	84	1991.	1		1310	159	8.	1		1925	234	0.
1		0045	10	0.	1		0700	85	1845.	1		1315	160	7.	1		1930	235	0.
1		0050	11	0.	1		0705	86	1712.	1		1320	161	6.	1		1935	236	0.
1		0055	12	0.	1		0710	87	1591.	1		1325	162	6.	1		1940	237	0.
1		0100	13	0.	1		0715	88	1480.	1		1330	163	5.	1		1945	238	0.
1		0105	14	0.	1		0720	89	1377.	1		1335	164	5.	1		1950	239	0.
1		0110	15	0.	1		0725	90	1282.	1		1340	165	5.	1		1955	240	0.
1		0115	16	0.	1		0730	91	1194.	1		1345	166	4.	1		2000	241	0.
1		0120	17	0.	1		0735	92	1111.	1		1350	167	4.	1		2005	242	0.
1		0125	18	0.	1		0740	93	1034.	1		1355	168	4.	1		2010	243	0.
1		0130	19	0.	1		0745	94	962.	1		1400	169	3.	1		2015	244	0.
1		0135	20	0.	1		0750	95	897.	1		1405	170	3.	1		2020	245	0.
1		0140	21	0.	1		0755	96	836.	1		1410	171	3.	1		2025	246	0.
1		0145	22	0.	1		0800	97	780.	1		1415	172	2.	1		2030	247	0.
1		0150	23	0.	1		0805	98	727.	1		1420	173	2.	1		2035	248	0.
1		0155	24	0.	1		0810	99	678.	1		1425	174	2.	1		2040	249	0.
1		0200	25	0.	1		0815	100	633.	1		1430	175	2.	1		2045	250	0.
1		0205	26	0.	1		0820	101	591.	1		1435	176	2.	1		2050	251	0.
1		0210	27	1.	1		0825	102	552.	1		1440	177	1.	1		2055	252	0.
1		0215	28	2.	1		0830	103	516.	1		1445	178	1.	1		2100	253	0.
1		0220	29	3.	1		0835	104	482.	1		1450	179	1.	1		2105	254	0.
1		0225	30	4.	1		0840	105	451.	1		1455	180	1.	1		2110	255	0.
1		0230	31	6.	1		0845	106	421.	1		1500	181	1.	1		2115	256	0.
1		0235	32	8.	1		0850	107	394.	1		1505	182	1.	1		2120	257	0.
1		0240	33	11.	1		0855	108	368.	1		1510	183	1.	1		2125	258	0.
1		0245	34	13.	1		0900	109	343.	1		1515	184	1.	1		2130	259	0.
1		0250	35	15.	1		0905	110	319.	1		1520	185	1.	1		2135	260	0.
1		0255	36	18.	1		0910	111	297.	1		1525	186	1.	1		2140	261	0.
1		0300	37	20.	1		0915	112	277.	1		1530	187	1.	1		2145	262	0.
1		0305	38	24.	1		0920	113	258.	1		1535	188	0.	1		2150	263	0.
1		0310	39	29.	1		0925	114	241.	1		1540	189	0.	1		2155	264	0.
1		0315	40	36.	1		0930	115	224.	1		1545	190	0.	1		2200	265	0.
1		0320	41	47.	1		0935	116	208.	1		1550	191	0.	1		2205	266	0.
1		0325	42	65.	1		0940	117	193.	1		1555	192	0.	1		2210	267	0.
1		0330	43	92.	1		0945	118	178.	1		1600	193	0.	1		2215	268	0.
1		0335	44	130.	1		0950	119	164.	1		1605	194	0.	1		2220	269	0.
1		0340	45	184.	1		0955	120	151.	1		1610	195	0.	1		2225	270	0.
1		0345	46	251.	1		1000	121	139.	1		1615	196	0.	1		2230	271	0.
1		0350	47	332.	1		1005	122	129.	1		1620	197	0.	1		2235	272	0.
1		0355	48	480.	1		1010	123	119.	1		1625	198	0.	1		2240	273	0.
1		0400	49	677.	1		1015	124	110.	1		1630	199	0.	1		2245	274	0.
1		0405	50	859.	1		1020	125	102.	1		1635	200	0.	1		2250	275	0.
1		0410	51	997.	1		1025	126	94.	1		1640	201	0.	1		2255	276	0.
1		0415	52	1090.	1		1030	127	88.	1		1645	202	0.	1		2300	277	0.
1		0420	53	1133.	1		1035	128	81.	1		1650	203	0.	1		2305	278	0.
1		0425	54	1142.	1		1040	129	76.	1		1655	204	0.	1		2310	279	0.
1		0430	55	1133.	1		1045	130	71.	1		1700	205	0.	1		2315	280	0.
1		0435	56	1630.	1		1050	131	66.	1		1705	206	0.	1		2320	281	0.
1		0440	57	4133.	1		1055	132	61.	1		1710	207	0.	1		2325	282	0.
1		0445	58	4035.	1		1100	133	57.	1		1715	208	0.	1		2330	283	0.
1		0450	59	3845.	1		1105	134	54.	1		1720	209	0.	1		2335	284	0.
1		0455	60	4187.	1		1110	135	50.	1		1725	210	0.	1		2340	285	0.
1		0500	61	3909.	1		1115	136	47.	1		1730	211	0.	1		2345	286	0.
1		0505	62	3987.	1		1120	137	44.	1		1735	212	0.	1		2350	287	0.

1	0510	63	3878.	*	1	1125	138	41.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	3836.	*	1	1130	139	38.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	3807.	*	1	1135	140	36.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	3796.	*	1	1140	141	33.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	3801.	*	1	1145	142	31.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	3811.	*	1	1150	143	28.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	3853.	*	1	1155	144	26.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	3932.	*	1	1200	145	24.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	4011.	*	1	1205	146	22.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	4023.	*	1	1210	147	21.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	3946.	*	1	1215	148	19.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	3807.	*	1	1220	149	17.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	3638.	*	1	1225	150	16.	*	1	1840	225	0.	*	2	0055	300	0.

****

PEAK FLOW (CFS)	TIME (HR)	MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
		(CFS)			
+ 4187.	4.92	1841.	471.	454.	454.
		(INCHES) .291	.298	.298	.298
		(AC-FT) 913.	935.	935.	935.

CUMULATIVE AREA = 58.84 SQ MI

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HYDROGRAPH AT STATION ULWIN
SUM OF 4 HYDROGRAPHS
PLAN 1, RATIO = .44

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DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	1882.	1		1230	151	18.	1		1845	226	0.
1		0005	2	0.	1		0620	77	1812.	1		1235	152	17.	1		1850	227	0.
1		0010	3	0.	1		0625	78	1729.	1		1240	153	16.	1		1855	228	0.
1		0015	4	0.	1		0630	79	1646.	1		1245	154	15.	1		1900	229	0.
1		0020	5	0.	1		0635	80	1550.	1		1250	155	14.	1		1905	230	0.
1		0025	6	0.	1		0640	81	1477.	1		1255	156	13.	1		1910	231	0.
1		0030	7	0.	1		0645	82	1421.	1		1300	157	12.	1		1915	232	0.
1		0035	8	0.	1		0650	83	1357.	1		1305	158	11.	1		1920	233	0.
1		0040	9	0.	1		0655	84	1275.	1		1310	159	10.	1		1925	234	0.
1		0045	10	0.	1		0700	85	1199.	1		1315	160	9.	1		1930	235	0.
1		0050	11	0.	1		0705	86	1128.	1		1320	161	9.	1		1935	236	0.
1		0055	12	0.	1		0710	87	1052.	1		1325	162	8.	1		1940	237	0.
1		0100	13	0.	1		0715	88	976.	1		1330	163	8.	1		1945	238	0.
1		0105	14	0.	1		0720	89	912.	1		1335	164	7.	1		1950	239	0.
1		0110	15	0.	1		0725	90	855.	1		1340	165	7.	1		1955	240	0.
1		0115	16	0.	1		0730	91	798.	1		1345	166	6.	1		2000	241	0.
1		0120	17	0.	1		0735	92	749.	1		1350	167	6.	1		2005	242	0.
1		0125	18	0.	1		0740	93	705.	1		1355	168	5.	1		2010	243	0.
1		0130	19	0.	1		0745	94	662.	1		1400	169	5.	1		2015	244	0.
1		0135	20	0.	1		0750	95	622.	1		1405	170	5.	1		2020	245	0.
1		0140	21	0.	1		0755	96	586.	1		1410	171	4.	1		2025	246	0.
1		0145	22	0.	1		0800	97	549.	1		1415	172	4.	1		2030	247	0.
1		0150	23	0.	1		0805	98	517.	1		1420	173	4.	1		2035	248	0.
1		0155	24	0.	1		0810	99	487.	1		1425	174	4.	1		2040	249	0.
1		0200	25	0.	1		0815	100	457.	1		1430	175	3.	1		2045	250	0.
1		0205	26	0.	1		0820	101	430.	1		1435	176	3.	1		2050	251	0.
1		0210	27	0.	1		0825	102	405.	1		1440	177	3.	1		2055	252	0.
1		0215	28	0.	1		0830	103	381.	1		1445	178	3.	1		2100	253	0.
1		0220	29	0.	1		0835	104	359.	1		1450	179	3.	1		2105	254	0.
1		0225	30	0.	1		0840	105	338.	1		1455	180	2.	1		2110	255	0.
1		0230	31	0.	1		0845	106	318.	1		1500	181	2.	1		2115	256	0.
1		0235	32	0.	1		0850	107	300.	1		1505	182	2.	1		2120	257	0.
1		0240	33	0.	1		0855	108	283.	1		1510	183	2.	1		2125	258	0.
1		0245	34	0.	1		0900	109	267.	1		1515	184	2.	1		2130	259	0.
1		0250	35	0.	1		0905	110	252.	1		1520	185	2.	1		2135	260	0.
1		0255	36	0.	1		0910	111	238.	1		1525	186	2.	1		2140	261	0.
1		0300	37	1.	1		0915	112	225.	1		1530	187	1.	1		2145	262	0.
1		0305	38	1.	1		0920	113	213.	1		1535	188	1.	1		2150	263	0.
1		0310	39	1.	1		0925	114	202.	1		1540	189	1.	1		2155	264	0.
1		0315	40	2.	1		0930	115	191.	1		1545	190	1.	1		2200	265	0.
1		0320	41	4.	1		0935	116	180.	1		1550	191	1.	1		2205	266	0.
1		0325	42	7.	1		0940	117	170.	1		1555	192	1.	1		2210	267	0.
1		0330	43	15.	1		0945	118	159.	1		1600	193	1.	1		2215	268	0.
1		0335	44	29.	1		0950	119	148.	1		1605	194	1.	1		2220	269	0.

1	0340	45	51.	*	1	0955	120	139.	*	1	1610	195	1.	*	1	2225	270	0.
1	0345	46	80.	*	1	1000	121	130.	*	1	1615	196	1.	*	1	2230	271	0.
1	0350	47	114.	*	1	1005	122	121.	*	1	1620	197	1.	*	1	2235	272	0.
1	0355	48	150.	*	1	1010	123	113.	*	1	1625	198	1.	*	1	2240	273	0.
1	0400	49	187.	*	1	1015	124	105.	*	1	1630	199	1.	*	1	2245	274	0.
1	0405	50	227.	*	1	1020	125	98.	*	1	1635	200	1.	*	1	2250	275	0.
1	0410	51	331.	*	1	1025	126	92.	*	1	1640	201	0.	*	1	2255	276	0.
1	0415	52	435.	*	1	1030	127	86.	*	1	1645	202	0.	*	1	2300	277	0.
1	0420	53	476.	*	1	1035	128	80.	*	1	1650	203	0.	*	1	2305	278	0.
1	0425	54	502.	*	1	1040	129	75.	*	1	1655	204	0.	*	1	2310	279	0.
1	0430	55	505.	*	1	1045	130	70.	*	1	1700	205	0.	*	1	2315	280	0.
1	0435	56	499.	*	1	1050	131	65.	*	1	1705	206	0.	*	1	2320	281	0.
1	0440	57	486.	*	1	1055	132	61.	*	1	1710	207	0.	*	1	2325	282	0.
1	0445	58	470.	*	1	1100	133	57.	*	1	1715	208	0.	*	1	2330	283	0.
1	0450	59	457.	*	1	1105	134	53.	*	1	1720	209	0.	*	1	2335	284	0.
1	0455	60	449.	*	1	1110	135	50.	*	1	1725	210	0.	*	1	2340	285	0.
1	0500	61	1403.	*	1	1115	136	46.	*	1	1730	211	0.	*	1	2345	286	0.
1	0505	62	2477.	*	1	1120	137	43.	*	1	1735	212	0.	*	1	2350	287	0.
1	0510	63	1533.	*	1	1125	138	41.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	1925.	*	1	1130	139	38.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	2145.	*	1	1135	140	36.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	1823.	*	1	1140	141	33.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	2030.	*	1	1145	142	31.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	1894.	*	1	1150	143	30.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	1853.	*	1	1155	144	28.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	1868.	*	1	1200	145	26.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	1873.	*	1	1205	146	25.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	1932.	*	1	1210	147	23.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	2004.	*	1	1215	148	22.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	2021.	*	1	1220	149	20.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	1992.	*	1	1225	150	19.	*	1	1840	225	0.	*	2	0055	300	0.

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PEAK FLOW (CFS)	TIME (HR)	MAXIMUM AVERAGE FLOW (CFS)	6-HR	24-HR	72-HR	24.92-HR
+ 2477.	5.08		908.	236.	227.	227.
		(INCHES)	.144	.149	.149	.149
		(AC-FT)	450.	467.	467.	467.

CUMULATIVE AREA = 58.84 SQ MI

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HYDROGRAPH AT STATION ULWIN
SUM OF 4 HYDROGRAPHS
PLAN 1, RATIO = .26

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DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	71.	1		1230	151	15.	1		1845	226	0.
1		0005	2	0.	1		0620	77	64.	1		1235	152	14.	1		1850	227	0.
1		0010	3	0.	1		0625	78	60.	1		1240	153	13.	1		1855	228	0.
1		0015	4	0.	1		0630	79	280.	1		1245	154	12.	1		1900	229	0.
1		0020	5	0.	1		0635	80	303.	1		1250	155	12.	1		1905	230	0.
1		0025	6	0.	1		0640	81	134.	1		1255	156	11.	1		1910	231	0.
1		0030	7	0.	1		0645	82	376.	1		1300	157	11.	1		1915	232	0.
1		0035	8	0.	1		0650	83	427.	1		1305	158	10.	1		1920	233	0.
1		0040	9	0.	1		0655	84	325.	1		1310	159	10.	1		1925	234	0.
1		0045	10	0.	1		0700	85	401.	1		1315	160	9.	1		1930	235	0.
1		0050	11	0.	1		0705	86	289.	1		1320	161	9.	1		1935	236	0.
1		0055	12	0.	1		0710	87	309.	1		1325	162	8.	1		1940	237	0.
1		0100	13	0.	1		0715	88	343.	1		1330	163	8.	1		1945	238	0.
1		0105	14	0.	1		0720	89	261.	1		1335	164	7.	1		1950	239	0.
1		0110	15	0.	1		0725	90	261.	1		1340	165	7.	1		1955	240	0.
1		0115	16	0.	1		0730	91	261.	1		1345	166	6.	1		2000	241	0.
1		0120	17	0.	1		0735	92	243.	1		1350	167	6.	1		2005	242	0.
1		0125	18	0.	1		0740	93	233.	1		1355	168	6.	1		2010	243	0.
1		0130	19	0.	1		0745	94	229.	1		1400	169	6.	1		2015	244	0.
1		0135	20	0.	1		0750	95	202.	1		1405	170	5.	1		2020	245	0.
1		0140	21	0.	1		0755	96	205.	1		1410	171	5.	1		2025	246	0.
1		0145	22	0.	1		0800	97	212.	1		1415	172	5.	1		2030	247	0.
1		0150	23	0.	1		0805	98	184.	1		1420	173	5.	1		2035	248	0.
1		0155	24	0.	1		0810	99	190.	1		1425	174	4.	1		2040	249	0.
1		0200	25	0.	1		0815	100	177.	1		1430	175	4.	1		2045	250	0.
1		0205	26	0.	1		0820	101	164.	1		1435	176	4.	1		2050	251	0.

1	0210	27	0.	*	1	0825	102	161.	*	1	1440	177	4.	*	1	2055	252	0.
1	0215	28	0.	*	1	0830	103	144.	*	1	1445	178	4.	*	1	2100	253	0.
1	0220	29	0.	*	1	0835	104	134.	*	1	1450	179	4.	*	1	2105	254	0.
1	0225	30	0.	*	1	0840	105	133.	*	1	1455	180	3.	*	1	2110	255	0.
1	0230	31	0.	*	1	0845	106	122.	*	1	1500	181	3.	*	1	2115	256	0.
1	0235	32	0.	*	1	0850	107	120.	*	1	1505	182	3.	*	1	2120	257	0.
1	0240	33	0.	*	1	0855	108	118.	*	1	1510	183	3.	*	1	2125	258	0.
1	0245	34	0.	*	1	0900	109	109.	*	1	1515	184	3.	*	1	2130	259	0.
1	0250	35	0.	*	1	0905	110	104.	*	1	1520	185	3.	*	1	2135	260	0.
1	0255	36	0.	*	1	0910	111	98.	*	1	1525	186	2.	*	1	2140	261	0.
1	0300	37	0.	*	1	0915	112	91.	*	1	1530	187	2.	*	1	2145	262	0.
1	0305	38	0.	*	1	0920	113	87.	*	1	1535	188	2.	*	1	2150	263	0.
1	0310	39	0.	*	1	0925	114	84.	*	1	1540	189	2.	*	1	2155	264	0.
1	0315	40	0.	*	1	0930	115	85.	*	1	1545	190	2.	*	1	2200	265	0.
1	0320	41	0.	*	1	0935	116	83.	*	1	1550	191	2.	*	1	2205	266	0.
1	0325	42	0.	*	1	0940	117	78.	*	1	1555	192	2.	*	1	2210	267	0.
1	0330	43	0.	*	1	0945	118	73.	*	1	1600	193	2.	*	1	2215	268	0.
1	0335	44	0.	*	1	0950	119	69.	*	1	1605	194	2.	*	1	2220	269	0.
1	0340	45	0.	*	1	0955	120	66.	*	1	1610	195	1.	*	1	2225	270	0.
1	0345	46	0.	*	1	1000	121	64.	*	1	1615	196	1.	*	1	2230	271	0.
1	0350	47	0.	*	1	1005	122	61.	*	1	1620	197	1.	*	1	2235	272	0.
1	0355	48	1.	*	1	1010	123	57.	*	1	1625	198	1.	*	1	2240	273	0.
1	0400	49	5.	*	1	1015	124	53.	*	1	1630	199	1.	*	1	2245	274	0.
1	0405	50	11.	*	1	1020	125	50.	*	1	1635	200	1.	*	1	2250	275	0.
1	0410	51	19.	*	1	1025	126	48.	*	1	1640	201	1.	*	1	2255	276	0.
1	0415	52	26.	*	1	1030	127	47.	*	1	1645	202	1.	*	1	2300	277	0.
1	0420	53	32.	*	1	1035	128	45.	*	1	1650	203	1.	*	1	2305	278	0.
1	0425	54	36.	*	1	1040	129	44.	*	1	1655	204	1.	*	1	2310	279	0.
1	0430	55	40.	*	1	1045	130	42.	*	1	1700	205	1.	*	1	2315	280	0.
1	0435	56	43.	*	1	1050	131	40.	*	1	1705	206	1.	*	1	2320	281	0.
1	0440	57	44.	*	1	1055	132	38.	*	1	1710	207	1.	*	1	2325	282	0.
1	0445	58	46.	*	1	1100	133	36.	*	1	1715	208	1.	*	1	2330	283	0.
1	0450	59	53.	*	1	1105	134	35.	*	1	1720	209	1.	*	1	2335	284	0.
1	0455	60	72.	*	1	1110	135	34.	*	1	1725	210	1.	*	1	2340	285	0.
1	0500	61	68.	*	1	1115	136	32.	*	1	1730	211	1.	*	1	2345	286	0.
1	0505	62	70.	*	1	1120	137	31.	*	1	1735	212	1.	*	1	2350	287	0.
1	0510	63	77.	*	1	1125	138	29.	*	1	1740	213	1.	*	1	2355	288	0.
1	0515	64	77.	*	1	1130	139	28.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	81.	*	1	1135	140	26.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	84.	*	1	1140	141	25.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	88.	*	1	1145	142	24.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	93.	*	1	1150	143	23.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	99.	*	1	1155	144	21.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	105.	*	1	1200	145	20.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	105.	*	1	1205	146	19.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	101.	*	1	1210	147	18.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	95.	*	1	1215	148	17.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	87.	*	1	1220	149	16.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	79.	*	1	1225	150	16.	*	1	1840	225	0.	*	2	0055	300	0.

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PEAK FLOW (CFS)	TIME (HR)	MAXIMUM AVERAGE FLOW (CFS)	6-HR	24-HR	72-HR	24.92-HR
+ 427.	6.83		140.	39.	38.	38.
		(INCHES)	.022	.025	.025	.025
		(AC-FT)	70.	77.	77.	77.

CUMULATIVE AREA = 58.84 SQ MI

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            *            *
1305 KK     *    FINISH  *
            *            *
            **************

1307 KO          OUTPUT CONTROL VARIABLES
                       IPRNT           1  PRINT CONTROL
                       IPLOT           0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE

                HYDROGRAPH ROUTING DATA
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1306 RD MUSKINGUM-CUNGE CHANNEL ROUTING

L	1500.	CHANNEL LENGTH
S	.0090	SLOPE
N	.050	CHANNEL ROUGHNESS COEFFICIENT
CA	.00	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	250.00	BOTTOM WIDTH OR DIAMETER
Z	3.00	SIDE SLOPE

***

COMPUTED MUSKINGUM-CUNGE PARAMETERS

ELEMENT	ALPHA	M	COMPUTATION TIME STEP DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	.08	1.64	2.55	750.00	10167.45	324.28	1.08	9.79
INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL								
MAIN	.08	1.64	5.00		10165.62	325.00	1.08	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5134E+04 EXCESS= .0000E+00 OUTFLOW= .5134E+04 BASIN STORAGE= .1018E-01 PERCENT ERROR= .0

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HYDROGRAPH AT STATION FINISH
PLAN 1, RATIO = 1.00

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DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	8337.	1		1230	151	2694.	1		1845	226	206.
1		0005	2	0.	1		0620	77	8531.	1		1235	152	2671.	1		1850	227	169.
1		0010	3	0.	1		0625	78	8797.	1		1240	153	2647.	1		1855	228	133.
1		0015	4	0.	1		0630	79	8947.	1		1245	154	2623.	1		1900	229	101.
1		0020	5	0.	1		0635	80	8964.	1		1250	155	2599.	1		1905	230	76.
1		0025	6	0.	1		0640	81	8883.	1		1255	156	2575.	1		1910	231	57.
1		0030	7	0.	1		0645	82	8726.	1		1300	157	2551.	1		1915	232	43.
1		0035	8	1.	1		0650	83	8513.	1		1305	158	2528.	1		1920	233	32.
1		0040	9	3.	1		0655	84	8261.	1		1310	159	2505.	1		1925	234	24.
1		0045	10	6.	1		0700	85	7980.	1		1315	160	2480.	1		1930	235	18.
1		0050	11	11.	1		0705	86	7678.	1		1320	161	2455.	1		1935	236	14.
1		0055	12	19.	1		0710	87	7362.	1		1325	162	2429.	1		1940	237	10.
1		0100	13	29.	1		0715	88	7038.	1		1330	163	2403.	1		1945	238	8.
1		0105	14	42.	1		0720	89	6711.	1		1335	164	2378.	1		1950	239	6.
1		0110	15	58.	1		0725	90	6384.	1		1340	165	2353.	1		1955	240	4.
1		0115	16	74.	1		0730	91	6057.	1		1345	166	2328.	1		2000	241	3.
1		0120	17	92.	1		0735	92	5734.	1		1350	167	2302.	1		2005	242	2.
1		0125	18	111.	1		0740	93	5417.	1		1355	168	2275.	1		2010	243	2.
1		0130	19	130.	1		0745	94	5117.	1		1400	169	2247.	1		2015	244	1.
1		0135	20	152.	1		0750	95	4859.	1		1405	170	2219.	1		2020	245	1.
1		0140	21	177.	1		0755	96	4672.	1		1410	171	2191.	1		2025	246	1.
1		0145	22	207.	1		0800	97	4552.	1		1415	172	2163.	1		2030	247	1.
1		0150	23	243.	1		0805	98	4463.	1		1420	173	2136.	1		2035	248	0.
1		0155	24	285.	1		0810	99	4381.	1		1425	174	2108.	1		2040	249	0.
1		0200	25	334.	1		0815	100	4305.	1		1430	175	2078.	1		2045	250	0.
1		0205	26	390.	1		0820	101	4233.	1		1435	176	2046.	1		2050	251	0.
1		0210	27	453.	1		0825	102	4164.	1		1440	177	2015.	1		2055	252	0.
1		0215	28	520.	1		0830	103	4100.	1		1445	178	1984.	1		2100	253	0.
1		0220	29	591.	1		0835	104	4039.	1		1450	179	1953.	1		2105	254	0.
1		0225	30	663.	1		0840	105	3981.	1		1455	180	1922.	1		2110	255	0.
1		0230	31	737.	1		0845	106	3927.	1		1500	181	1889.	1		2115	256	0.
1		0235	32	809.	1		0850	107	3875.	1		1505	182	1855.	1		2120	257	0.
1		0240	33	877.	1		0855	108	3826.	1		1510	183	1819.	1		2125	258	0.
1		0245	34	938.	1		0900	109	3780.	1		1515	184	1784.	1		2130	259	0.
1		0250	35	994.	1		0905	110	3737.	1		1520	185	1750.	1		2135	260	0.
1		0255	36	1046.	1		0910	111	3695.	1		1525	186	1716.	1		2140	261	0.
1		0300	37	1100.	1		0915	112	3657.	1		1530	187	1680.	1		2145	262	0.
1		0305	38	1171.	1		0920	113	3620.	1		1535	188	1644.	1		2150	263	0.
1		0310	39	1275.	1		0925	114	3586.	1		1540	189	1606.	1		2155	264	0.
1		0315	40	1428.	1		0930	115	3552.	1		1545	190	1570.	1		2200	265	0.
1		0320	41	1653.	1		0935	116	3520.	1		1550	191	1534.	1		2205	266	0.
1		0325	42	1968.	1		0940	117	3488.	1		1555	192	1498.	1		2210	267	0.
1		0330	43	2392.	1		0945	118	3457.	1		1600	193	1461.	1		2215	268	0.

1	0335	44	2939.	*	1	0950	119	3428.	*	1	1605	194	1423.	*	1	2220	269	0.
1	0340	45	3603.	*	1	0955	120	3399.	*	1	1610	195	1384.	*	1	2225	270	0.
1	0345	46	4358.	*	1	1000	121	3372.	*	1	1615	196	1346.	*	1	2230	271	0.
1	0350	47	5169.	*	1	1005	122	3346.	*	1	1620	197	1309.	*	1	2235	272	0.
1	0355	48	5994.	*	1	1010	123	3320.	*	1	1625	198	1273.	*	1	2240	273	0.
1	0400	49	6760.	*	1	1015	124	3296.	*	1	1630	199	1235.	*	1	2245	274	0.
1	0405	50	7406.	*	1	1020	125	3272.	*	1	1635	200	1197.	*	1	2250	275	0.
1	0410	51	7918.	*	1	1025	126	3248.	*	1	1640	201	1157.	*	1	2255	276	0.
1	0415	52	8322.	*	1	1030	127	3223.	*	1	1645	202	1118.	*	1	2300	277	0.
1	0420	53	8644.	*	1	1035	128	3199.	*	1	1650	203	1080.	*	1	2305	278	0.
1	0425	54	8884.	*	1	1040	129	3176.	*	1	1655	204	1043.	*	1	2310	279	0.
1	0430	55	9037.	*	1	1045	130	3153.	*	1	1700	205	1006.	*	1	2315	280	0.
1	0435	56	9120.	*	1	1050	131	3130.	*	1	1705	206	968.	*	1	2320	281	0.
1	0440	57	9158.	*	1	1055	132	3108.	*	1	1710	207	928.	*	1	2325	282	0.
1	0445	58	9175.	*	1	1100	133	3087.	*	1	1715	208	889.	*	1	2330	283	0.
1	0450	59	9216.	*	1	1105	134	3066.	*	1	1720	209	851.	*	1	2335	284	0.
1	0455	60	9319.	*	1	1110	135	3045.	*	1	1725	210	814.	*	1	2340	285	0.
1	0500	61	9482.	*	1	1115	136	3023.	*	1	1730	211	779.	*	1	2345	286	0.
1	0505	62	9670.	*	1	1120	137	3001.	*	1	1735	212	743.	*	1	2350	287	0.
1	0510	63	9856.	*	1	1125	138	2979.	*	1	1740	213	705.	*	1	2355	288	0.
1	0515	64	10020.	*	1	1130	139	2957.	*	1	1745	214	665.	*	2	0000	289	0.
1	0520	65	10130.	*	1	1135	140	2935.	*	1	1750	215	625.	*	2	0005	290	0.
1	0525	66	10166.	*	1	1140	141	2914.	*	1	1755	216	588.	*	2	0010	291	0.
1	0530	67	10126.	*	1	1145	142	2893.	*	1	1800	217	552.	*	2	0015	292	0.
1	0535	68	10018.	*	1	1150	143	2872.	*	1	1805	218	517.	*	2	0020	293	0.
1	0540	69	9855.	*	1	1155	144	2851.	*	1	1810	219	480.	*	2	0025	294	0.
1	0545	70	9647.	*	1	1200	145	2828.	*	1	1815	220	438.	*	2	0030	295	0.
1	0550	71	9403.	*	1	1205	146	2805.	*	1	1820	221	393.	*	2	0035	296	0.
1	0555	72	9139.	*	1	1210	147	2782.	*	1	1825	222	349.	*	2	0040	297	0.
1	0600	73	8866.	*	1	1215	148	2760.	*	1	1830	223	308.	*	2	0045	298	0.
1	0605	74	8596.	*	1	1220	149	2738.	*	1	1835	224	272.	*	2	0050	299	0.
1	0610	75	8380.	*	1	1225	150	2716.	*	1	1840	225	239.	*	2	0055	300	0.

****

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)				
		(CFS)			
+ 10166.	5.42	6908.	2588.	2493.	2493.
		(INCHES) .723	1.083	1.083	1.083
		(AC-FT) 3425.	5134.	5134.	5134.

CUMULATIVE AREA = 88.86 SQ MI

COMPUTED MUSKINGUM-CUNGE PARAMETERS

ELEMENT	ALPHA	M	COMPUTATION TIME STEP DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	.08	1.64	2.75	750.00	8379.41	327.51	.83	9.08

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

MAIN	.08	1.64	5.00		8374.66	325.00	.83

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3953E+04 EXCESS= .0000E+00 OUTFLOW= .3953E+04 BASIN STORAGE= .1047E-01 PERCENT ERROR= .0

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HYDROGRAPH AT STATION FINISH
PLAN 1, RATIO = .87

****

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	6849.	1		1230	151	2222.	1		1845	226	1.
1		0005	2	0.	1		0620	77	6667.	1		1235	152	2193.	1		1850	227	1.
1		0010	3	0.	1		0625	78	6491.	1		1240	153	2165.	1		1855	228	1.
1		0015	4	0.	1		0630	79	6319.	1		1245	154	2136.	1		1900	229	1.
1		0020	5	0.	1		0635	80	6151.	1		1250	155	2106.	1		1905	230	0.
1		0025	6	0.	1		0640	81	5988.	1		1255	156	2074.	1		1910	231	0.
1		0030	7	0.	1		0645	82	5828.	1		1300	157	2042.	1		1915	232	0.
1		0035	8	0.	1		0650	83	5674.	1		1305	158	2009.	1		1920	233	0.

1	0040	9	0.	*	1	0655	84	5527.	*	1	1310	159	1978.	*	1	1925	234	0.
1	0045	10	1.	*	1	0700	85	5385.	*	1	1315	160	1946.	*	1	1930	235	0.
1	0050	11	2.	*	1	0705	86	5249.	*	1	1320	161	1914.	*	1	1935	236	0.
1	0055	12	4.	*	1	0710	87	5119.	*	1	1325	162	1880.	*	1	1940	237	0.
1	0100	13	7.	*	1	0715	88	4995.	*	1	1330	163	1844.	*	1	1945	238	0.
1	0105	14	11.	*	1	0720	89	4877.	*	1	1335	164	1808.	*	1	1950	239	0.
1	0110	15	17.	*	1	0725	90	4764.	*	1	1340	165	1773.	*	1	1955	240	0.
1	0115	16	23.	*	1	0730	91	4656.	*	1	1345	166	1739.	*	1	2000	241	0.
1	0120	17	31.	*	1	0735	92	4551.	*	1	1350	167	1703.	*	1	2005	242	0.
1	0125	18	40.	*	1	0740	93	4449.	*	1	1355	168	1667.	*	1	2010	243	0.
1	0130	19	50.	*	1	0745	94	4352.	*	1	1400	169	1629.	*	1	2015	244	0.
1	0135	20	62.	*	1	0750	95	4261.	*	1	1405	170	1592.	*	1	2020	245	0.
1	0140	21	77.	*	1	0755	96	4175.	*	1	1410	171	1555.	*	1	2025	246	0.
1	0145	22	95.	*	1	0800	97	4094.	*	1	1415	172	1519.	*	1	2030	247	0.
1	0150	23	117.	*	1	0805	98	4020.	*	1	1420	173	1483.	*	1	2035	248	0.
1	0155	24	144.	*	1	0810	99	3950.	*	1	1425	174	1445.	*	1	2040	249	0.
1	0200	25	176.	*	1	0815	100	3885.	*	1	1430	175	1407.	*	1	2045	250	0.
1	0205	26	213.	*	1	0820	101	3824.	*	1	1435	176	1368.	*	1	2050	251	0.
1	0210	27	254.	*	1	0825	102	3766.	*	1	1440	177	1330.	*	1	2055	252	0.
1	0215	28	299.	*	1	0830	103	3711.	*	1	1445	178	1294.	*	1	2100	253	0.
1	0220	29	347.	*	1	0835	104	3658.	*	1	1450	179	1257.	*	1	2105	254	0.
1	0225	30	395.	*	1	0840	105	3607.	*	1	1455	180	1219.	*	1	2110	255	0.
1	0230	31	443.	*	1	0845	106	3559.	*	1	1500	181	1179.	*	1	2115	256	0.
1	0235	32	488.	*	1	0850	107	3512.	*	1	1505	182	1140.	*	1	2120	257	0.
1	0240	33	529.	*	1	0855	108	3468.	*	1	1510	183	1101.	*	1	2125	258	0.
1	0245	34	565.	*	1	0900	109	3425.	*	1	1515	184	1064.	*	1	2130	259	0.
1	0250	35	596.	*	1	0905	110	3385.	*	1	1520	185	1027.	*	1	2135	260	0.
1	0255	36	629.	*	1	0910	111	3346.	*	1	1525	186	989.	*	1	2140	261	0.
1	0300	37	668.	*	1	0915	112	3310.	*	1	1530	187	950.	*	1	2145	262	0.
1	0305	38	721.	*	1	0920	113	3275.	*	1	1535	188	911.	*	1	2150	263	0.
1	0310	39	794.	*	1	0925	114	3241.	*	1	1540	189	872.	*	1	2155	264	0.
1	0315	40	901.	*	1	0930	115	3208.	*	1	1545	190	835.	*	1	2200	265	0.
1	0320	41	1059.	*	1	0935	116	3175.	*	1	1550	191	799.	*	1	2205	266	0.
1	0325	42	1274.	*	1	0940	117	3143.	*	1	1555	192	763.	*	1	2210	267	0.
1	0330	43	1569.	*	1	0945	118	3112.	*	1	1600	193	727.	*	1	2215	268	0.
1	0335	44	1973.	*	1	0950	119	3082.	*	1	1605	194	688.	*	1	2220	269	0.
1	0340	45	2491.	*	1	0955	120	3052.	*	1	1610	195	648.	*	1	2225	270	0.
1	0345	46	3098.	*	1	1000	121	3024.	*	1	1615	196	610.	*	1	2230	271	0.
1	0350	47	3765.	*	1	1005	122	2996.	*	1	1620	197	575.	*	1	2235	272	0.
1	0355	48	4443.	*	1	1010	123	2969.	*	1	1625	198	540.	*	1	2240	273	0.
1	0400	49	5076.	*	1	1015	124	2942.	*	1	1630	199	507.	*	1	2245	274	0.
1	0405	50	5622.	*	1	1020	125	2914.	*	1	1635	200	471.	*	1	2250	275	0.
1	0410	51	6055.	*	1	1025	126	2886.	*	1	1640	201	430.	*	1	2255	276	0.
1	0415	52	6385.	*	1	1030	127	2859.	*	1	1645	202	387.	*	1	2300	277	0.
1	0420	53	6639.	*	1	1035	128	2833.	*	1	1650	203	345.	*	1	2305	278	0.
1	0425	54	6834.	*	1	1040	129	2807.	*	1	1655	204	307.	*	1	2310	279	0.
1	0430	55	6988.	*	1	1045	130	2781.	*	1	1700	205	273.	*	1	2315	280	0.
1	0435	56	7114.	*	1	1050	131	2756.	*	1	1705	206	242.	*	1	2320	281	0.
1	0440	57	7212.	*	1	1055	132	2731.	*	1	1710	207	209.	*	1	2325	282	0.
1	0445	58	7286.	*	1	1100	133	2705.	*	1	1715	208	174.	*	1	2330	283	0.
1	0450	59	7369.	*	1	1105	134	2678.	*	1	1720	209	137.	*	1	2335	284	0.
1	0455	60	7494.	*	1	1110	135	2652.	*	1	1725	210	106.	*	1	2340	285	0.
1	0500	61	7664.	*	1	1115	136	2626.	*	1	1730	211	80.	*	1	2345	286	0.
1	0505	62	7853.	*	1	1120	137	2600.	*	1	1735	212	61.	*	1	2350	287	0.
1	0510	63	8038.	*	1	1125	138	2575.	*	1	1740	213	46.	*	1	2355	288	0.
1	0515	64	8201.	*	1	1130	139	2550.	*	1	1745	214	35.	*	2	0000	289	0.
1	0520	65	8319.	*	1	1135	140	2524.	*	1	1750	215	26.	*	2	0005	290	0.
1	0525	66	8375.	*	1	1140	141	2498.	*	1	1755	216	20.	*	2	0010	291	0.
1	0530	67	8367.	*	1	1145	142	2470.	*	1	1800	217	15.	*	2	0015	292	0.
1	0535	68	8301.	*	1	1150	143	2443.	*	1	1805	218	11.	*	2	0020	293	0.
1	0540	69	8187.	*	1	1155	144	2416.	*	1	1810	219	9.	*	2	0025	294	0.
1	0545	70	8036.	*	1	1200	145	2389.	*	1	1815	220	7.	*	2	0030	295	0.
1	0550	71	7856.	*	1	1205	146	2363.	*	1	1820	221	5.	*	2	0035	296	0.
1	0555	72	7659.	*	1	1210	147	2336.	*	1	1825	222	4.	*	2	0040	297	0.
1	0600	73	7453.	*	1	1215	148	2309.	*	1	1830	223	3.	*	2	0045	298	0.
1	0605	74	7244.	*	1	1220	149	2280.	*	1	1835	224	2.	*	2	0050	299	0.
1	0610	75	7041.	*	1	1225	150	2251.	*	1	1840	225	2.	*	2	0055	300	0.
				*					*					*				

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 8375.	5.42		5512.	1993.	1920.	1920.
		(INCHES)	.577	.834	.834	.834
		(AC-FT)	2733.	3953.	3953.	3953.

CUMULATIVE AREA = 88.86 SQ MI

COMPUTED MUSKINGUM-CUNGE PARAMETERS

ELEMENT	ALPHA	COMPUTATION TIME STEP M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	.08	1.64	3.03	750.00	6550.66	330.18	.60	8.25
		INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL						
MAIN	.08	1.64	5.00		6550.51	330.00	.60	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2858E+04 EXCESS= .0000E+00 OUTFLOW= .2858E+04 BASIN STORAGE= .1127E-01 PERCENT ERROR= .0

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HYDROGRAPH AT STATION FINISH
PLAN 1, RATIO = .74

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DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	5527.	1		1230	151	1389.	1		1845	226	0.
1		0005	2	0.	1		0620	77	5399.	1		1235	152	1350.	1		1850	227	0.
1		0010	3	0.	1		0625	78	5275.	1		1240	153	1313.	1		1855	228	0.
1		0015	4	0.	1		0630	79	5152.	1		1245	154	1275.	1		1900	229	0.
1		0020	5	0.	1		0635	80	5032.	1		1250	155	1237.	1		1905	230	0.
1		0025	6	0.	1		0640	81	4914.	1		1255	156	1197.	1		1910	231	0.
1		0030	7	0.	1		0645	82	4797.	1		1300	157	1157.	1		1915	232	0.
1		0035	8	0.	1		0650	83	4683.	1		1305	158	1117.	1		1920	233	0.
1		0040	9	0.	1		0655	84	4573.	1		1310	159	1079.	1		1925	234	0.
1		0045	10	0.	1		0700	85	4466.	1		1315	160	1042.	1		1930	235	0.
1		0050	11	0.	1		0705	86	4362.	1		1320	161	1004.	1		1935	236	0.
1		0055	12	0.	1		0710	87	4262.	1		1325	162	965.	1		1940	237	0.
1		0100	13	0.	1		0715	88	4167.	1		1330	163	925.	1		1945	238	0.
1		0105	14	1.	1		0720	89	4075.	1		1335	164	886.	1		1950	239	0.
1		0110	15	2.	1		0725	90	3987.	1		1340	165	848.	1		1955	240	0.
1		0115	16	3.	1		0730	91	3902.	1		1345	166	812.	1		2000	241	0.
1		0120	17	4.	1		0735	92	3819.	1		1350	167	776.	1		2005	242	0.
1		0125	18	7.	1		0740	93	3738.	1		1355	168	739.	1		2010	243	0.
1		0130	19	10.	1		0745	94	3660.	1		1400	169	701.	1		2015	244	0.
1		0135	20	14.	1		0750	95	3586.	1		1405	170	661.	1		2020	245	0.
1		0140	21	20.	1		0755	96	3515.	1		1410	171	622.	1		2025	246	0.
1		0145	22	28.	1		0800	97	3449.	1		1415	172	586.	1		2030	247	0.
1		0150	23	38.	1		0805	98	3386.	1		1420	173	551.	1		2035	248	0.
1		0155	24	51.	1		0810	99	3327.	1		1425	174	518.	1		2040	249	0.
1		0200	25	68.	1		0815	100	3272.	1		1430	175	484.	1		2045	250	0.
1		0205	26	88.	1		0820	101	3219.	1		1435	176	447.	1		2050	251	0.
1		0210	27	112.	1		0825	102	3169.	1		1440	177	407.	1		2055	252	0.
1		0215	28	138.	1		0830	103	3120.	1		1445	178	366.	1		2100	253	0.
1		0220	29	167.	1		0835	104	3073.	1		1450	179	328.	1		2105	254	0.
1		0225	30	197.	1		0840	105	3028.	1		1455	180	293.	1		2110	255	0.
1		0230	31	227.	1		0845	106	2983.	1		1500	181	261.	1		2115	256	0.
1		0235	32	256.	1		0850	107	2939.	1		1505	182	231.	1		2120	257	0.
1		0240	33	282.	1		0855	108	2897.	1		1510	183	198.	1		2125	258	0.
1		0245	34	305.	1		0900	109	2857.	1		1515	184	162.	1		2130	259	0.
1		0250	35	324.	1		0905	110	2818.	1		1520	185	127.	1		2135	260	0.
1		0255	36	342.	1		0910	111	2781.	1		1525	186	97.	1		2140	261	0.
1		0300	37	363.	1		0915	112	2744.	1		1530	187	74.	1		2145	262	0.
1		0305	38	391.	1		0920	113	2709.	1		1535	188	56.	1		2150	263	0.
1		0310	39	430.	1		0925	114	2674.	1		1540	189	42.	1		2155	264	0.
1		0315	40	491.	1		0930	115	2639.	1		1545	190	32.	1		2200	265	0.
1		0320	41	582.	1		0935	116	2604.	1		1550	191	25.	1		2205	266	0.
1		0325	42	718.	1		0940	117	2570.	1		1555	192	19.	1		2210	267	0.
1		0330	43	917.	1		0945	118	2536.	1		1600	193	14.	1		2215	268	0.
1		0335	44	1196.	1		0950	119	2504.	1		1605	194	11.	1		2220	269	0.
1		0340	45	1565.	1		0955	120	2472.	1		1610	195	8.	1		2225	270	0.
1		0345	46	2003.	1		1000	121	2440.	1		1615	196	6.	1		2230	271	0.
1		0350	47	2482.	1		1005	122	2408.	1		1620	197	5.	1		2235	272	0.
1		0355	48	2987.	1		1010	123	2375.	1		1625	198	4.	1		2240	273	0.
1		0400	49	3480.	1		1015	124	2342.	1		1630	199	3.	1		2245	274	0.
1		0405	50	3924.	1		1020	125	2310.	1		1635	200	2.	1		2250	275	0.
1		0410	51	4291.	1		1025	126	2278.	1		1640	201	2.	1		2255	276	0.
1		0415	52	4573.	1		1030	127	2246.	1		1645	202	1.	1		2300	277	0.
1		0420	53	4781.	1		1035	128	2215.	1		1650	203	1.	1		2305	278	0.
1		0425	54	4919.	1		1040	129	2183.	1		1655	204	1.	1		2310	279	0.

1	0430	55	5009.	*	1	1045	130	2151.	*	1	1700	205	1.	*	1	2315	280	0.
1	0435	56	5095.	*	1	1050	131	2117.	*	1	1705	206	0.	*	1	2320	281	0.
1	0440	57	5200.	*	1	1055	132	2082.	*	1	1710	207	0.	*	1	2325	282	0.
1	0445	58	5318.	*	1	1100	133	2049.	*	1	1715	208	0.	*	1	2330	283	0.
1	0450	59	5447.	*	1	1105	134	2015.	*	1	1720	209	0.	*	1	2335	284	0.
1	0455	60	5604.	*	1	1110	135	1982.	*	1	1725	210	0.	*	1	2340	285	0.
1	0500	61	5791.	*	1	1115	136	1949.	*	1	1730	211	0.	*	1	2345	286	0.
1	0505	62	5984.	*	1	1120	137	1913.	*	1	1735	212	0.	*	1	2350	287	0.
1	0510	63	6169.	*	1	1125	138	1876.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	6335.	*	1	1130	139	1839.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	6459.	*	1	1135	140	1803.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	6530.	*	1	1140	141	1767.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	6551.	*	1	1145	142	1731.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	6522.	*	1	1150	143	1694.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	6453.	*	1	1155	144	1656.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	6355.	*	1	1200	145	1617.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	6232.	*	1	1205	146	1580.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	6094.	*	1	1210	147	1543.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	5950.	*	1	1215	148	1506.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	5805.	*	1	1220	149	1468.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	5662.	*	1	1225	150	1429.	*	1	1840	225	0.	*	2	0055	300	0.

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PEAK FLOW (CFS)	TIME (HR)	MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
+ 6551.	5.50	(CFS) 4357.	1441.	1388.	1388.
		(INCHES) .456	.603	.603	.603
		(AC-FT) 2160.	2858.	2858.	2858.

CUMULATIVE AREA = 88.86 SQ MI

COMPUTED MUSKINGUM-CUNGE PARAMETERS

ELEMENT	ALPHA	M	COMPUTATION TIME STEP DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	.08	1.64	3.64	750.00	4087.82	334.85	.34	6.87
INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL								
MAIN	.08	1.64	5.00		4087.61	335.00	.34	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1606E+04 EXCESS= .0000E+00 OUTFLOW= .1606E+04 BASIN STORAGE= .1077E-01 PERCENT ERROR= .0

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HYDROGRAPH AT STATION FINISH
PLAN 1, RATIO = .57

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DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	3647.	1		1230	151	321.	1		1845	226	0.
1		0005	2	0.	1		0620	77	3584.	1		1235	152	292.	1		1850	227	0.
1		0010	3	0.	1		0625	78	3521.	1		1240	153	265.	1		1855	228	0.
1		0015	4	0.	1		0630	79	3459.	1		1245	154	240.	1		1900	229	0.
1		0020	5	0.	1		0635	80	3396.	1		1250	155	213.	1		1905	230	0.
1		0025	6	0.	1		0640	81	3332.	1		1255	156	183.	1		1910	231	0.
1		0030	7	0.	1		0645	82	3267.	1		1300	157	150.	1		1915	232	0.
1		0035	8	0.	1		0650	83	3203.	1		1305	158	120.	1		1920	233	0.
1		0040	9	0.	1		0655	84	3139.	1		1310	159	96.	1		1925	234	0.
1		0045	10	0.	1		0700	85	3076.	1		1315	160	76.	1		1930	235	0.
1		0050	11	0.	1		0705	86	3013.	1		1320	161	61.	1		1935	236	0.
1		0055	12	0.	1		0710	87	2951.	1		1325	162	50.	1		1940	237	0.
1		0100	13	0.	1		0715	88	2891.	1		1330	163	41.	1		1945	238	0.
1		0105	14	0.	1		0720	89	2831.	1		1335	164	34.	1		1950	239	0.
1		0110	15	0.	1		0725	90	2773.	1		1340	165	28.	1		1955	240	0.
1		0115	16	0.	1		0730	91	2717.	1		1345	166	24.	1		2000	241	0.
1		0120	17	0.	1		0735	92	2660.	1		1350	167	20.	1		2005	242	0.
1		0125	18	0.	1		0740	93	2604.	1		1355	168	18.	1		2010	243	0.
1		0130	19	0.	1		0745	94	2550.	1		1400	169	15.	1		2015	244	0.

1	0135	20	0.	*	1	0750	95	2496.	*	1	1405	170	13.	*	1	2020	245	0.
1	0140	21	0.	*	1	0755	96	2445.	*	1	1410	171	12.	*	1	2025	246	0.
1	0145	22	1.	*	1	0800	97	2395.	*	1	1415	172	10.	*	1	2030	247	0.
1	0150	23	1.	*	1	0805	98	2348.	*	1	1420	173	9.	*	1	2035	248	0.
1	0155	24	3.	*	1	0810	99	2302.	*	1	1425	174	8.	*	1	2040	249	0.
1	0200	25	5.	*	1	0815	100	2257.	*	1	1430	175	7.	*	1	2045	250	0.
1	0205	26	8.	*	1	0820	101	2213.	*	1	1435	176	7.	*	1	2050	251	0.
1	0210	27	13.	*	1	0825	102	2169.	*	1	1440	177	6.	*	1	2055	252	0.
1	0215	28	19.	*	1	0830	103	2124.	*	1	1445	178	5.	*	1	2100	253	0.
1	0220	29	27.	*	1	0835	104	2081.	*	1	1450	179	5.	*	1	2105	254	0.
1	0225	30	36.	*	1	0840	105	2039.	*	1	1455	180	4.	*	1	2110	255	0.
1	0230	31	46.	*	1	0845	106	1997.	*	1	1500	181	4.	*	1	2115	256	0.
1	0235	32	57.	*	1	0850	107	1957.	*	1	1505	182	4.	*	1	2120	257	0.
1	0240	33	68.	*	1	0855	108	1917.	*	1	1510	183	3.	*	1	2125	258	0.
1	0245	34	78.	*	1	0900	109	1878.	*	1	1515	184	3.	*	1	2130	259	0.
1	0250	35	88.	*	1	0905	110	1838.	*	1	1520	185	3.	*	1	2135	260	0.
1	0255	36	97.	*	1	0910	111	1798.	*	1	1525	186	2.	*	1	2140	261	0.
1	0300	37	107.	*	1	0915	112	1758.	*	1	1530	187	2.	*	1	2145	262	0.
1	0305	38	119.	*	1	0920	113	1719.	*	1	1535	188	2.	*	1	2150	263	0.
1	0310	39	137.	*	1	0925	114	1680.	*	1	1540	189	2.	*	1	2155	264	0.
1	0315	40	162.	*	1	0930	115	1643.	*	1	1545	190	2.	*	1	2200	265	0.
1	0320	41	200.	*	1	0935	116	1606.	*	1	1550	191	2.	*	1	2205	266	0.
1	0325	42	255.	*	1	0940	117	1568.	*	1	1555	192	1.	*	1	2210	267	0.
1	0330	43	342.	*	1	0945	118	1530.	*	1	1600	193	1.	*	1	2215	268	0.
1	0335	44	477.	*	1	0950	119	1491.	*	1	1605	194	1.	*	1	2220	269	0.
1	0340	45	663.	*	1	0955	120	1452.	*	1	1610	195	1.	*	1	2225	270	0.
1	0345	46	900.	*	1	1000	121	1414.	*	1	1615	196	1.	*	1	2230	271	0.
1	0350	47	1175.	*	1	1005	122	1377.	*	1	1620	197	1.	*	1	2235	272	0.
1	0355	48	1474.	*	1	1010	123	1340.	*	1	1625	198	1.	*	1	2240	273	0.
1	0400	49	1772.	*	1	1015	124	1303.	*	1	1630	199	1.	*	1	2245	274	0.
1	0405	50	2039.	*	1	1020	125	1265.	*	1	1635	200	1.	*	1	2250	275	0.
1	0410	51	2263.	*	1	1025	126	1226.	*	1	1640	201	1.	*	1	2255	276	0.
1	0415	52	2453.	*	1	1030	127	1186.	*	1	1645	202	1.	*	1	2300	277	0.
1	0420	53	2602.	*	1	1035	128	1148.	*	1	1650	203	0.	*	1	2305	278	0.
1	0425	54	2715.	*	1	1040	129	1111.	*	1	1655	204	0.	*	1	2310	279	0.
1	0430	55	2798.	*	1	1045	130	1074.	*	1	1700	205	0.	*	1	2315	280	0.
1	0435	56	2844.	*	1	1050	131	1038.	*	1	1705	206	0.	*	1	2320	281	0.
1	0440	57	2865.	*	1	1055	132	1000.	*	1	1710	207	0.	*	1	2325	282	0.
1	0445	58	2879.	*	1	1100	133	961.	*	1	1715	208	0.	*	1	2330	283	0.
1	0450	59	2920.	*	1	1105	134	923.	*	1	1720	209	0.	*	1	2335	284	0.
1	0455	60	3023.	*	1	1110	135	885.	*	1	1725	210	0.	*	1	2340	285	0.
1	0500	61	3207.	*	1	1115	136	849.	*	1	1730	211	0.	*	1	2345	286	0.
1	0505	62	3418.	*	1	1120	137	814.	*	1	1735	212	0.	*	1	2350	287	0.
1	0510	63	3610.	*	1	1125	138	780.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	3776.	*	1	1130	139	744.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	3914.	*	1	1135	140	706.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	4012.	*	1	1140	141	668.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	4066.	*	1	1145	142	631.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	4088.	*	1	1150	143	596.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	4075.	*	1	1155	144	563.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	4039.	*	1	1200	145	531.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	3988.	*	1	1205	146	498.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	3922.	*	1	1210	147	463.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	3851.	*	1	1215	148	425.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	3780.	*	1	1220	149	388.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	3712.	*	1	1225	150	353.	*	1	1840	225	0.	*	2	0055	300	0.
				*					*					*				

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PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)				
		(CFS)			
+ 4088.	5.58	2749.	810.	780.	780.
		(INCHES) .288	.339	.339	.339
		(AC-FT) 1363.	1606.	1606.	1606.

CUMULATIVE AREA = 88.86 SQ MI

COMPUTED MUSKINGUM-CUNGE PARAMETERS

ELEMENT	ALPHA	M	COMPUTATION TIME STEP DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	.08	1.64	4.59	750.00	2246.39	344.44	.18	5.44

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

MAIN .08 1.64 5.00 2245.91 345.00 .18

CONTINUITY SUMMARY (AC-FT) - INFLOW= .8302E+03 EXCESS= .0000E+00 OUTFLOW= .8303E+03 BASIN STORAGE= .1093E-01 PERCENT ERROR= .0

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HYDROGRAPH AT STATION FINISH
PLAN 1, RATIO = .44

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DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	2093.	1		1230	151	48.	1		1845	226	0.
1		0005	2	0.	1		0620	77	2070.	1		1235	152	45.	1		1850	227	0.
1		0010	3	0.	1		0625	78	2051.	1		1240	153	42.	1		1855	228	0.
1		0015	4	0.	1		0630	79	2030.	1		1245	154	39.	1		1900	229	0.
1		0020	5	0.	1		0635	80	2007.	1		1250	155	36.	1		1905	230	0.
1		0025	6	0.	1		0640	81	1980.	1		1255	156	34.	1		1910	231	0.
1		0030	7	0.	1		0645	82	1950.	1		1300	157	32.	1		1915	232	0.
1		0035	8	0.	1		0650	83	1917.	1		1305	158	30.	1		1920	233	0.
1		0040	9	0.	1		0655	84	1884.	1		1310	159	28.	1		1925	234	0.
1		0045	10	0.	1		0700	85	1850.	1		1315	160	26.	1		1930	235	0.
1		0050	11	0.	1		0705	86	1817.	1		1320	161	25.	1		1935	236	0.
1		0055	12	0.	1		0710	87	1783.	1		1325	162	23.	1		1940	237	0.
1		0100	13	0.	1		0715	88	1749.	1		1330	163	22.	1		1945	238	0.
1		0105	14	0.	1		0720	89	1715.	1		1335	164	20.	1		1950	239	0.
1		0110	15	0.	1		0725	90	1681.	1		1340	165	19.	1		1955	240	0.
1		0115	16	0.	1		0730	91	1647.	1		1345	166	18.	1		2000	241	0.
1		0120	17	0.	1		0735	92	1613.	1		1350	167	16.	1		2005	242	0.
1		0125	18	0.	1		0740	93	1577.	1		1355	168	15.	1		2010	243	0.
1		0130	19	0.	1		0745	94	1541.	1		1400	169	14.	1		2015	244	0.
1		0135	20	0.	1		0750	95	1504.	1		1405	170	13.	1		2020	245	0.
1		0140	21	0.	1		0755	96	1467.	1		1410	171	12.	1		2025	246	0.
1		0145	22	0.	1		0800	97	1430.	1		1415	172	12.	1		2030	247	0.
1		0150	23	0.	1		0805	98	1394.	1		1420	173	11.	1		2035	248	0.
1		0155	24	0.	1		0810	99	1358.	1		1425	174	10.	1		2040	249	0.
1		0200	25	0.	1		0815	100	1324.	1		1430	175	9.	1		2045	250	0.
1		0205	26	0.	1		0820	101	1290.	1		1435	176	9.	1		2050	251	0.
1		0210	27	0.	1		0825	102	1257.	1		1440	177	8.	1		2055	252	0.
1		0215	28	0.	1		0830	103	1224.	1		1445	178	7.	1		2100	253	0.
1		0220	29	0.	1		0835	104	1192.	1		1450	179	7.	1		2105	254	0.
1		0225	30	1.	1		0840	105	1161.	1		1455	180	6.	1		2110	255	0.
1		0230	31	2.	1		0845	106	1130.	1		1500	181	6.	1		2115	256	0.
1		0235	32	3.	1		0850	107	1097.	1		1505	182	6.	1		2120	257	0.
1		0240	33	4.	1		0855	108	1064.	1		1510	183	5.	1		2125	258	0.
1		0245	34	5.	1		0900	109	1029.	1		1515	184	5.	1		2130	259	0.
1		0250	35	7.	1		0905	110	996.	1		1520	185	5.	1		2135	260	0.
1		0255	36	9.	1		0910	111	963.	1		1525	186	4.	1		2140	261	0.
1		0300	37	12.	1		0915	112	932.	1		1530	187	4.	1		2145	262	0.
1		0305	38	15.	1		0920	113	901.	1		1535	188	4.	1		2150	263	0.
1		0310	39	20.	1		0925	114	871.	1		1540	189	4.	1		2155	264	0.
1		0315	40	28.	1		0930	115	842.	1		1545	190	3.	1		2200	265	0.
1		0320	41	41.	1		0935	116	813.	1		1550	191	3.	1		2205	266	0.
1		0325	42	61.	1		0940	117	783.	1		1555	192	3.	1		2210	267	0.
1		0330	43	91.	1		0945	118	751.	1		1600	193	3.	1		2215	268	0.
1		0335	44	136.	1		0950	119	717.	1		1605	194	3.	1		2220	269	0.
1		0340	45	212.	1		0955	120	685.	1		1610	195	2.	1		2225	270	0.
1		0345	46	323.	1		1000	121	654.	1		1615	196	2.	1		2230	271	0.
1		0350	47	460.	1		1005	122	625.	1		1620	197	2.	1		2235	272	0.
1		0355	48	621.	1		1010	123	597.	1		1625	198	2.	1		2240	273	0.
1		0400	49	794.	1		1015	124	569.	1		1630	199	2.	1		2245	274	0.
1		0405	50	952.	1		1020	125	543.	1		1635	200	2.	1		2250	275	0.
1		0410	51	1085.	1		1025	126	517.	1		1640	201	2.	1		2255	276	0.
1		0415	52	1190.	1		1030	127	488.	1		1645	202	2.	1		2300	277	0.
1		0420	53	1272.	1		1035	128	456.	1		1650	203	1.	1		2305	278	0.
1		0425	54	1336.	1		1040	129	421.	1		1655	204	1.	1		2310	279	0.
1		0430	55	1385.	1		1045	130	389.	1		1700	205	1.	1		2315	280	0.
1		0435	56	1426.	1		1050	131	360.	1		1705	206	1.	1		2320	281	0.
1		0440	57	1462.	1		1055	132	334.	1		1710	207	1.	1		2325	282	0.
1		0445	58	1489.	1		1100	133	310.	1		1715	208	1.	1		2330	283	0.
1		0450	59	1508.	1		1105	134	287.	1		1720	209	1.	1		2335	284	0.
1		0455	60	1539.	1		1110	135	267.	1		1725	210	1.	1		2340	285	0.
1		0500	61	1592.	1		1115	136	248.	1		1730	211	1.	1		2345	286	0.
1		0505	62	1653.	1		1120	137	230.	1		1735	212	1.	1		2350	287	0.
1		0510	63	1722.	1		1125	138	212.	1		1740	213	1.	1		2355	288	0.
1		0515	64	1801.	1		1130	139	191.	1		1745	214	1.	2		0000	289	0.
1		0520	65	1903.	1		1135	140	168.	1		1750	215	1.	2		0005	290	0.

1	0525	66	2028.	*	1	1140	141	147.	*	1	1755	216	1.	*	2	0010	291	0.
1	0530	67	2146.	*	1	1145	142	127.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	2214.	*	1	1150	143	110.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	2237.	*	1	1155	144	97.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	2246.	*	1	1200	145	85.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	2239.	*	1	1205	146	76.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	2217.	*	1	1210	147	68.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	2190.	*	1	1215	148	62.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	2156.	*	1	1220	149	57.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	2122.	*	1	1225	150	52.	*	1	1840	225	0.	*	2	0055	300	0.
				*					*					*				

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PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)				
		(CFS)			
+ 2246.	5.75	1514.	419.	403.	403.
		(INCHES) .158	.175	.175	.175
		(AC-FT) 751.	830.	830.	830.

CUMULATIVE AREA = 88.86 SQ MI

COMPUTED MUSKINGUM-CUNGE PARAMETERS

ELEMENT	ALPHA	M	COMPUTATION TIME STEP DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	.08	1.64	5.00	375.00	374.06	340.00	.03	2.71

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

MAIN	.08	1.64	5.00		374.06	340.00	.03

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1451E+03 EXCESS= .0000E+00 OUTFLOW= .1452E+03 BASIN STORAGE= .1247E-01 PERCENT ERROR= .0

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HYDROGRAPH AT STATION FINISH
PLAN 1, RATIO = .26

****

DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	*	1		0615	76	303.	*	1		1230	151	36.	*	1		1845	226	1.
1		0005	2	0.	*	1		0620	77	292.	*	1		1235	152	35.	*	1		1850	227	1.
1		0010	3	0.	*	1		0625	78	283.	*	1		1240	153	34.	*	1		1855	228	1.
1		0015	4	0.	*	1		0630	79	275.	*	1		1245	154	32.	*	1		1900	229	1.
1		0020	5	0.	*	1		0635	80	267.	*	1		1250	155	31.	*	1		1905	230	1.
1		0025	6	0.	*	1		0640	81	257.	*	1		1255	156	30.	*	1		1910	231	1.
1		0030	7	0.	*	1		0645	82	245.	*	1		1300	157	29.	*	1		1915	232	1.
1		0035	8	0.	*	1		0650	83	232.	*	1		1305	158	28.	*	1		1920	233	1.
1		0040	9	0.	*	1		0655	84	220.	*	1		1310	159	27.	*	1		1925	234	1.
1		0045	10	0.	*	1		0700	85	209.	*	1		1315	160	26.	*	1		1930	235	1.
1		0050	11	0.	*	1		0705	86	205.	*	1		1320	161	25.	*	1		1935	236	1.
1		0055	12	0.	*	1		0710	87	221.	*	1		1325	162	24.	*	1		1940	237	1.
1		0100	13	0.	*	1		0715	88	266.	*	1		1330	163	23.	*	1		1945	238	1.
1		0105	14	0.	*	1		0720	89	314.	*	1		1335	164	22.	*	1		1950	239	1.
1		0110	15	0.	*	1		0725	90	323.	*	1		1340	165	21.	*	1		1955	240	1.
1		0115	16	0.	*	1		0730	91	320.	*	1		1345	166	20.	*	1		2000	241	0.
1		0120	17	0.	*	1		0735	92	339.	*	1		1350	167	19.	*	1		2005	242	0.
1		0125	18	0.	*	1		0740	93	345.	*	1		1355	168	18.	*	1		2010	243	0.
1		0130	19	0.	*	1		0745	94	333.	*	1		1400	169	17.	*	1		2015	244	0.
1		0135	20	0.	*	1		0750	95	335.	*	1		1405	170	16.	*	1		2020	245	0.
1		0140	21	0.	*	1		0755	96	335.	*	1		1410	171	15.	*	1		2025	246	0.
1		0145	22	0.	*	1		0800	97	322.	*	1		1415	172	15.	*	1		2030	247	0.
1		0150	23	0.	*	1		0805	98	318.	*	1		1420	173	14.	*	1		2035	248	0.
1		0155	24	0.	*	1		0810	99	311.	*	1		1425	174	13.	*	1		2040	249	0.
1		0200	25	0.	*	1		0815	100	301.	*	1		1430	175	12.	*	1		2045	250	0.
1		0205	26	0.	*	1		0820	101	297.	*	1		1435	176	12.	*	1		2050	251	0.
1		0210	27	0.	*	1		0825	102	287.	*	1		1440	177	11.	*	1		2055	252	0.
1		0215	28	0.	*	1		0830	103	277.	*	1		1445	178	11.	*	1		2100	253	0.
1		0220	29	0.	*	1		0835	104	272.	*	1		1450	179	10.	*	1		2105	254	0.
1		0225	30	0.	*	1		0840	105	262.	*	1		1455	180	10.	*	1		2110	255	0.

1	0230	31	0.	*	1	0845	106	255.	*	1	1500	181	9.	*	1	2115	256	0.
1	0235	32	0.	*	1	0850	107	248.	*	1	1505	182	9.	*	1	2120	257	0.
1	0240	33	0.	*	1	0855	108	239.	*	1	1510	183	8.	*	1	2125	258	0.
1	0245	34	0.	*	1	0900	109	231.	*	1	1515	184	8.	*	1	2130	259	0.
1	0250	35	0.	*	1	0905	110	222.	*	1	1520	185	7.	*	1	2135	260	0.
1	0255	36	0.	*	1	0910	111	213.	*	1	1525	186	7.	*	1	2140	261	0.
1	0300	37	0.	*	1	0915	112	201.	*	1	1530	187	7.	*	1	2145	262	0.
1	0305	38	0.	*	1	0920	113	188.	*	1	1535	188	6.	*	1	2150	263	0.
1	0310	39	0.	*	1	0925	114	174.	*	1	1540	189	6.	*	1	2155	264	0.
1	0315	40	0.	*	1	0930	115	162.	*	1	1545	190	6.	*	1	2200	265	0.
1	0320	41	0.	*	1	0935	116	153.	*	1	1550	191	6.	*	1	2205	266	0.
1	0325	42	0.	*	1	0940	117	146.	*	1	1555	192	5.	*	1	2210	267	0.
1	0330	43	0.	*	1	0945	118	139.	*	1	1600	193	5.	*	1	2215	268	0.
1	0335	44	0.	*	1	0950	119	131.	*	1	1605	194	5.	*	1	2220	269	0.
1	0340	45	0.	*	1	0955	120	125.	*	1	1610	195	5.	*	1	2225	270	0.
1	0345	46	1.	*	1	1000	121	119.	*	1	1615	196	5.	*	1	2230	271	0.
1	0350	47	5.	*	1	1005	122	113.	*	1	1620	197	4.	*	1	2235	272	0.
1	0355	48	14.	*	1	1010	123	108.	*	1	1625	198	4.	*	1	2240	273	0.
1	0400	49	29.	*	1	1015	124	103.	*	1	1630	199	4.	*	1	2245	274	0.
1	0405	50	61.	*	1	1020	125	99.	*	1	1635	200	4.	*	1	2250	275	0.
1	0410	51	92.	*	1	1025	126	96.	*	1	1640	201	4.	*	1	2255	276	0.
1	0415	52	120.	*	1	1030	127	93.	*	1	1645	202	3.	*	1	2300	277	0.
1	0420	53	145.	*	1	1035	128	90.	*	1	1650	203	3.	*	1	2305	278	0.
1	0425	54	170.	*	1	1040	129	86.	*	1	1655	204	3.	*	1	2310	279	0.
1	0430	55	191.	*	1	1045	130	82.	*	1	1700	205	3.	*	1	2315	280	0.
1	0435	56	205.	*	1	1050	131	79.	*	1	1705	206	3.	*	1	2320	281	0.
1	0440	57	213.	*	1	1055	132	76.	*	1	1710	207	3.	*	1	2325	282	0.
1	0445	58	219.	*	1	1100	133	73.	*	1	1715	208	3.	*	1	2330	283	0.
1	0450	59	222.	*	1	1105	134	70.	*	1	1720	209	2.	*	1	2335	284	0.
1	0455	60	225.	*	1	1110	135	67.	*	1	1725	210	2.	*	1	2340	285	0.
1	0500	61	231.	*	1	1115	136	64.	*	1	1730	211	2.	*	1	2345	286	0.
1	0505	62	241.	*	1	1120	137	61.	*	1	1735	212	2.	*	1	2350	287	0.
1	0510	63	258.	*	1	1125	138	59.	*	1	1740	213	2.	*	1	2355	288	0.
1	0515	64	281.	*	1	1130	139	56.	*	1	1745	214	2.	*	2	0000	289	0.
1	0520	65	309.	*	1	1135	140	54.	*	1	1750	215	2.	*	2	0005	290	0.
1	0525	66	337.	*	1	1140	141	52.	*	1	1755	216	2.	*	2	0010	291	0.
1	0530	67	358.	*	1	1145	142	50.	*	1	1800	217	2.	*	2	0015	292	0.
1	0535	68	370.	*	1	1150	143	49.	*	1	1805	218	2.	*	2	0020	293	0.
1	0540	69	374.	*	1	1155	144	47.	*	1	1810	219	1.	*	2	0025	294	0.
1	0545	70	373.	*	1	1200	145	45.	*	1	1815	220	1.	*	2	0030	295	0.
1	0550	71	370.	*	1	1205	146	43.	*	1	1820	221	1.	*	2	0035	296	0.
1	0555	72	360.	*	1	1210	147	42.	*	1	1825	222	1.	*	2	0040	297	0.
1	0600	73	345.	*	1	1215	148	40.	*	1	1830	223	1.	*	2	0045	298	0.
1	0605	74	330.	*	1	1220	149	39.	*	1	1835	224	1.	*	2	0050	299	0.
1	0610	75	317.	*	1	1225	150	38.	*	1	1840	225	1.	*	2	0055	300	0.
				*					*					*				

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 374.	5.67		254.	73.	71.	71.
		(INCHES)	.027	.031	.031	.031
		(AC-FT)	126.	145.	145.	145.

CUMULATIVE AREA = 88.86 SQ MI

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1****************************************                                                    ****************************************
 *                                      *                                                    *                                      *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *                                                    *    U.S. ARMY CORPS OF ENGINEERS      *
 *               JUN   1998             *                                                    *    HYDROLOGIC ENGINEERING CENTER     *
 *            VERSION 4.1               *                                                    *          609 SECOND STREET           *
 *                                      *                                                    *       DAVIS, CALIFORNIA 95616        *
 *  RUN DATE   18MAR08  TIME  14:51:55  *                                                    *           (916) 756-1104             *
 *                                      *                                                    *                                      *
 ****************************************                                                    ****************************************
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X     X  XXXXXXX   XXXXX           X
X     X  X        X     X         XX
X     X  X        X                X
XXXXXXX  XXXX     X        XXXXX   X
X     X  X        X                X
X     X  X        X     X          X
X     X  XXXXXXX   XXXXX          XXX
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THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

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1                                                   HEC-1 INPUT                                                PAGE  1

          LINE           ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 *** FREE ***
 *** NOLIST ***
1****************************************                                                    ****************************************
 *                                      *                                                    *                                      *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *                                                    *    U.S. ARMY CORPS OF ENGINEERS      *
 *               JUN   1998             *                                                    *    HYDROLOGIC ENGINEERING CENTER     *
 *            VERSION 4.1               *                                                    *          609 SECOND STREET           *
 *                                      *                                                    *       DAVIS, CALIFORNIA 95616        *
 *  RUN DATE   18MAR08  TIME  14:51:55  *                                                    *           (916) 756-1104             *
 *                                      *                                                    *                                      *
 ****************************************                                                    ****************************************
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KLEINFELDER
FEBRUARY 2008
ALTERNATIVE D

DESIGN STORM = 100-YEAR 6-HOUR STORM
STORM DISTRIBUTION = SDN5

```
  10 IO          OUTPUT CONTROL VARIABLES
                       IPRNT           5  PRINT CONTROL
                       IPLOT           0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE

     IT          HYDROGRAPH TIME DATA
                        NMIN           5  MINUTES IN COMPUTATION INTERVAL
                       IDATE      1    0  STARTING DATE
                       ITIME        0000  STARTING TIME
                          NQ         300  NUMBER OF HYDROGRAPH ORDINATES
                      NDDATE      2    0  ENDING DATE
                      NDTIME        0055  ENDING TIME
                      ICENT           19  CENTURY MARK

                  COMPUTATION INTERVAL     .08 HOURS
                       TOTAL TIME BASE   24.92 HOURS

          ENGLISH UNITS
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              DRAINAGE AREA         SQUARE MILES
              PRECIPITATION DEPTH   INCHES
              LENGTH, ELEVATION     FEET
              FLOW                  CUBIC FEET PER SECOND
              STORAGE VOLUME        ACRE-FEET
              SURFACE AREA          ACRES
              TEMPERATURE           DEGREES FAHRENHEIT

     JP          MULTI-PLAN OPTION
                       NPLAN           1  NUMBER OF PLANS

     JR          MULTI-RATIO OPTION
                     RATIOS OF PRECIPITATION
                   1.00       .87       .74       .57       .44       .26


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


            **************
            *            *
1250 KK     *     ULWIN  *
            *            *
            **************

1254 KO          OUTPUT CONTROL VARIABLES
                       IPRNT           1  PRINT CONTROL
                       IPLOT           0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE

1253 HC          HYDROGRAPH COMBINATION
                       ICOMP           4  NUMBER OF HYDROGRAPHS TO COMBINE

                                                                  ***
*****************************************************************************************************************************************

                                                HYDROGRAPH AT STATION    ULWIN
                                                     SUM OF  4 HYDROGRAPHS
                                                   PLAN 1,   RATIO =  1.00
*****************************************************************************************************************************************
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DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	8025.	1		1230	151	4.	1		1845	226	0.
1		0005	2	0.	1		0620	77	7327.	1		1235	152	4.	1		1850	227	0.
1		0010	3	0.	1		0625	78	6692.	1		1240	153	3.	1		1855	228	0.
1		0015	4	0.	1		0630	79	6118.	1		1245	154	3.	1		1900	229	0.
1		0020	5	0.	1		0635	80	5601.	1		1250	155	2.	1		1905	230	0.
1		0025	6	0.	1		0640	81	5138.	1		1255	156	2.	1		1910	231	0.
1		0030	7	0.	1		0645	82	4718.	1		1300	157	2.	1		1915	232	0.
1		0035	8	0.	1		0650	83	4335.	1		1305	158	2.	1		1920	233	0.
1		0040	9	0.	1		0655	84	3986.	1		1310	159	1.	1		1925	234	0.
1		0045	10	0.	1		0700	85	3665.	1		1315	160	1.	1		1930	235	0.
1		0050	11	1.	1		0705	86	3369.	1		1320	161	1.	1		1935	236	0.
1		0055	12	2.	1		0710	87	3095.	1		1325	162	1.	1		1940	237	0.
1		0100	13	4.	1		0715	88	2840.	1		1330	163	1.	1		1945	238	0.
1		0105	14	6.	1		0720	89	2604.	1		1335	164	1.	1		1950	239	0.
1		0110	15	9.	1		0725	90	2386.	1		1340	165	1.	1		1955	240	0.
1		0115	16	12.	1		0730	91	2185.	1		1345	166	0.	1		2000	241	0.
1		0120	17	16.	1		0735	92	2000.	1		1350	167	0.	1		2005	242	0.
1		0125	18	20.	1		0740	93	1829.	1		1355	168	0.	1		2010	243	0.
1		0130	19	25.	1		0745	94	1673.	1		1400	169	0.	1		2015	244	0.
1		0135	20	31.	1		0750	95	1530.	1		1405	170	0.	1		2020	245	0.
1		0140	21	39.	1		0755	96	1400.	1		1410	171	0.	1		2025	246	0.
1		0145	22	47.	1		0800	97	1282.	1		1415	172	0.	1		2030	247	0.
1		0150	23	59.	1		0805	98	1175.	1		1420	173	0.	1		2035	248	0.
1		0155	24	73.	1		0810	99	1076.	1		1425	174	0.	1		2040	249	0.
1		0200	25	94.	1		0815	100	982.	1		1430	175	0.	1		2045	250	0.
1		0205	26	123.	1		0820	101	893.	1		1435	176	0.	1		2050	251	0.
1		0210	27	160.	1		0825	102	810.	1		1440	177	0.	1		2055	252	0.
1		0215	28	206.	1		0830	103	733.	1		1445	178	0.	1		2100	253	0.
1		0220	29	257.	1		0835	104	663.	1		1450	179	0.	1		2105	254	0.
1		0225	30	312.	1		0840	105	600.	1		1455	180	0.	1		2110	255	0.
1		0230	31	368.	1		0845	106	542.	1		1500	181	0.	1		2115	256	0.
1		0235	32	427.	1		0850	107	491.	1		1505	182	0.	1		2120	257	0.
1		0240	33	489.	1		0855	108	444.	1		1510	183	0.	1		2125	258	0.
1		0245	34	558.	1		0900	109	403.	1		1515	184	0.	1		2130	259	0.
1		0250	35	635.	1		0905	110	366.	1		1520	185	0.	1		2135	260	0.

1	0255	36	722.	*	1	0910	111	332.	*	1	1525	186	0.	*	1	2140	261	0.
1	0300	37	820.	*	1	0915	112	302.	*	1	1530	187	0.	*	1	2145	262	0.
1	0305	38	932.	*	1	0920	113	276.	*	1	1535	188	0.	*	1	2150	263	0.
1	0310	39	1058.	*	1	0925	114	251.	*	1	1540	189	0.	*	1	2155	264	0.
1	0315	40	1201.	*	1	0930	115	229.	*	1	1545	190	0.	*	1	2200	265	0.
1	0320	41	1364.	*	1	0935	116	208.	*	1	1550	191	0.	*	1	2205	266	0.
1	0325	42	1561.	*	1	0940	117	189.	*	1	1555	192	0.	*	1	2210	267	0.
1	0330	43	1813.	*	1	0945	118	171.	*	1	1600	193	0.	*	1	2215	268	0.
1	0335	44	2146.	*	1	0950	119	155.	*	1	1605	194	0.	*	1	2220	269	0.
1	0340	45	2579.	*	1	0955	120	140.	*	1	1610	195	0.	*	1	2225	270	0.
1	0345	46	3110.	*	1	1000	121	127.	*	1	1615	196	0.	*	1	2230	271	0.
1	0350	47	3762.	*	1	1005	122	114.	*	1	1620	197	0.	*	1	2235	272	0.
1	0355	48	4685.	*	1	1010	123	103.	*	1	1625	198	0.	*	1	2240	273	0.
1	0400	49	6275.	*	1	1015	124	93.	*	1	1630	199	0.	*	1	2245	274	0.
1	0405	50	8792.	*	1	1020	125	84.	*	1	1635	200	0.	*	1	2250	275	0.
1	0410	51	11642.	*	1	1025	126	75.	*	1	1640	201	0.	*	1	2255	276	0.
1	0415	52	13970.	*	1	1030	127	68.	*	1	1645	202	0.	*	1	2300	277	0.
1	0420	53	15495.	*	1	1035	128	61.	*	1	1650	203	0.	*	1	2305	278	0.
1	0425	54	16279.	*	1	1040	129	55.	*	1	1655	204	0.	*	1	2310	279	0.
1	0430	55	16488.	*	1	1045	130	49.	*	1	1700	205	0.	*	1	2315	280	0.
1	0435	56	16294.	*	1	1050	131	44.	*	1	1705	206	0.	*	1	2320	281	0.
1	0440	57	15790.	*	1	1055	132	39.	*	1	1710	207	0.	*	1	2325	282	0.
1	0445	58	15093.	*	1	1100	133	35.	*	1	1715	208	0.	*	1	2330	283	0.
1	0450	59	14348.	*	1	1105	134	31.	*	1	1720	209	0.	*	1	2335	284	0.
1	0455	60	13647.	*	1	1110	135	28.	*	1	1725	210	0.	*	1	2340	285	0.
1	0500	61	13076.	*	1	1115	136	25.	*	1	1730	211	0.	*	1	2345	286	0.
1	0505	62	12676.	*	1	1120	137	22.	*	1	1735	212	0.	*	1	2350	287	0.
1	0510	63	12444.	*	1	1125	138	20.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	12373.	*	1	1130	139	18.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	12437.	*	1	1135	140	16.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	12586.	*	1	1140	141	14.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	12746.	*	1	1145	142	13.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	12817.	*	1	1150	143	11.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	12697.	*	1	1155	144	10.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	12353.	*	1	1200	145	9.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	11808.	*	1	1205	146	8.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	11124.	*	1	1210	147	7.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	10360.	*	1	1215	148	6.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	9564.	*	1	1220	149	5.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	8775.	*	1	1225	150	5.	*	1	1840	225	0.	*	2	0055	300	0.

****

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 16488.	4.50		6356.	1619.	1559.	1559.
		(INCHES)	1.004	1.023	1.023	1.023
		(AC-FT)	3152.	3210.	3210.	3210.

CUMULATIVE AREA = 58.84 SQ MI

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HYDROGRAPH AT STATION ULWIN
SUM OF 4 HYDROGRAPHS
PLAN 1, RATIO = .87

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DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	6737.	1		1230	151	6.	1		1845	226	0.
1		0005	2	0.	1		0620	77	6169.	1		1235	152	6.	1		1850	227	0.
1		0010	3	0.	1		0625	78	5647.	1		1240	153	5.	1		1855	228	0.
1		0015	4	0.	1		0630	79	5174.	1		1245	154	4.	1		1900	229	0.
1		0020	5	0.	1		0635	80	4744.	1		1250	155	4.	1		1905	230	0.
1		0025	6	0.	1		0640	81	4357.	1		1255	156	3.	1		1910	231	0.
1		0030	7	0.	1		0645	82	4007.	1		1300	157	3.	1		1915	232	0.
1		0035	8	0.	1		0650	83	3688.	1		1305	158	3.	1		1920	233	0.
1		0040	9	0.	1		0655	84	3399.	1		1310	159	2.	1		1925	234	0.
1		0045	10	0.	1		0700	85	3134.	1		1315	160	2.	1		1930	235	0.
1		0050	11	0.	1		0705	86	2889.	1		1320	161	2.	1		1935	236	0.
1		0055	12	0.	1		0710	87	2662.	1		1325	162	2.	1		1940	237	0.
1		0100	13	0.	1		0715	88	2451.	1		1330	163	1.	1		1945	238	0.
1		0105	14	1.	1		0720	89	2255.	1		1335	164	1.	1		1950	239	0.
1		0110	15	1.	1		0725	90	2074.	1		1340	165	1.	1		1955	240	0.
1		0115	16	2.	1		0730	91	1908.	1		1345	166	1.	1		2000	241	0.
1		0120	17	3.	1		0735	92	1755.	1		1350	167	1.	1		2005	242	0.

1	0125	18	4.	*	1	0740	93	1614.	*	1	1355	168	1.	*	1	2010	243	0.
1	0130	19	6.	*	1	0745	94	1484.	*	1	1400	169	1.	*	1	2015	244	0.
1	0135	20	8.	*	1	0750	95	1365.	*	1	1405	170	0.	*	1	2020	245	0.
1	0140	21	11.	*	1	0755	96	1256.	*	1	1410	171	0.	*	1	2025	246	0.
1	0145	22	15.	*	1	0800	97	1155.	*	1	1415	172	0.	*	1	2030	247	0.
1	0150	23	19.	*	1	0805	98	1064.	*	1	1420	173	0.	*	1	2035	248	0.
1	0155	24	25.	*	1	0810	99	978.	*	1	1425	174	0.	*	1	2040	249	0.
1	0200	25	33.	*	1	0815	100	897.	*	1	1430	175	0.	*	1	2045	250	0.
1	0205	26	43.	*	1	0820	101	822.	*	1	1435	176	0.	*	1	2050	251	0.
1	0210	27	56.	*	1	0825	102	753.	*	1	1440	177	0.	*	1	2055	252	0.
1	0215	28	72.	*	1	0830	103	688.	*	1	1445	178	0.	*	1	2100	253	0.
1	0220	29	92.	*	1	0835	104	628.	*	1	1450	179	0.	*	1	2105	254	0.
1	0225	30	116.	*	1	0840	105	571.	*	1	1455	180	0.	*	1	2110	255	0.
1	0230	31	143.	*	1	0845	106	519.	*	1	1500	181	0.	*	1	2115	256	0.
1	0235	32	173.	*	1	0850	107	471.	*	1	1505	182	0.	*	1	2120	257	0.
1	0240	33	205.	*	1	0855	108	427.	*	1	1510	183	0.	*	1	2125	258	0.
1	0245	34	239.	*	1	0900	109	387.	*	1	1515	184	0.	*	1	2130	259	0.
1	0250	35	277.	*	1	0905	110	351.	*	1	1520	185	0.	*	1	2135	260	0.
1	0255	36	320.	*	1	0910	111	319.	*	1	1525	186	0.	*	1	2140	261	0.
1	0300	37	370.	*	1	0915	112	290.	*	1	1530	187	0.	*	1	2145	262	0.
1	0305	38	430.	*	1	0920	113	265.	*	1	1535	188	0.	*	1	2150	263	0.
1	0310	39	508.	*	1	0925	114	242.	*	1	1540	189	0.	*	1	2155	264	0.
1	0315	40	605.	*	1	0930	115	221.	*	1	1545	190	0.	*	1	2200	265	0.
1	0320	41	725.	*	1	0935	116	202.	*	1	1550	191	0.	*	1	2205	266	0.
1	0325	42	870.	*	1	0940	117	185.	*	1	1555	192	0.	*	1	2210	267	0.
1	0330	43	1051.	*	1	0945	118	170.	*	1	1600	193	0.	*	1	2215	268	0.
1	0335	44	1290.	*	1	0950	119	156.	*	1	1605	194	0.	*	1	2220	269	0.
1	0340	45	1608.	*	1	0955	120	143.	*	1	1610	195	0.	*	1	2225	270	0.
1	0345	46	1994.	*	1	1000	121	131.	*	1	1615	196	0.	*	1	2230	271	0.
1	0350	47	2420.	*	1	1005	122	120.	*	1	1620	197	0.	*	1	2235	272	0.
1	0355	48	2864.	*	1	1010	123	110.	*	1	1625	198	0.	*	1	2240	273	0.
1	0400	49	3352.	*	1	1015	124	100.	*	1	1630	199	0.	*	1	2245	274	0.
1	0405	50	4353.	*	1	1020	125	92.	*	1	1635	200	0.	*	1	2250	275	0.
1	0410	51	6609.	*	1	1025	126	84.	*	1	1640	201	0.	*	1	2255	276	0.
1	0415	52	9227.	*	1	1030	127	77.	*	1	1645	202	0.	*	1	2300	277	0.
1	0420	53	10826.	*	1	1035	128	70.	*	1	1650	203	0.	*	1	2305	278	0.
1	0425	54	11711.	*	1	1040	129	64.	*	1	1655	204	0.	*	1	2310	279	0.
1	0430	55	12106.	*	1	1045	130	58.	*	1	1700	205	0.	*	1	2315	280	0.
1	0435	56	12126.	*	1	1050	131	53.	*	1	1705	206	0.	*	1	2320	281	0.
1	0440	57	11967.	*	1	1055	132	48.	*	1	1710	207	0.	*	1	2325	282	0.
1	0445	58	11670.	*	1	1100	133	43.	*	1	1715	208	0.	*	1	2330	283	0.
1	0450	59	11245.	*	1	1105	134	39.	*	1	1720	209	0.	*	1	2335	284	0.
1	0455	60	10755.	*	1	1110	135	35.	*	1	1725	210	0.	*	1	2340	285	0.
1	0500	61	10295.	*	1	1115	136	32.	*	1	1730	211	0.	*	1	2345	286	0.
1	0505	62	9932.	*	1	1120	137	29.	*	1	1735	212	0.	*	1	2350	287	0.
1	0510	63	9705.	*	1	1125	138	26.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	9616.	*	1	1130	139	23.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	9645.	*	1	1135	140	21.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	9760.	*	1	1140	141	19.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	9927.	*	1	1145	142	17.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	10079.	*	1	1150	143	15.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	10116.	*	1	1155	144	13.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	9954.	*	1	1200	145	12.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	9596.	*	1	1205	146	11.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	9111.	*	1	1210	147	10.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	8556.	*	1	1215	148	9.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	7953.	*	1	1220	149	8.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	7339.	*	1	1225	150	7.	*	1	1840	225	0.	*	2	0055	300	0.

****

PEAK FLOW (CFS)	TIME (HR)	MAXIMUM AVERAGE FLOW (CFS) 6-HR	24-HR	72-HR	24.92-HR
+ 12126.	4.58	4861.	1237.	1191.	1191.
		(INCHES) .768	.782	.782	.782
		(AC-FT) 2411.	2453.	2453.	2453.

CUMULATIVE AREA = 58.84 SQ MI

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HYDROGRAPH AT STATION ULWIN
SUM OF 4 HYDROGRAPHS
PLAN 1, RATIO = .74

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DA MON HRMN	ORD	FLOW	*	DA MON HRMN	ORD	FLOW	*	DA MON HRMN	ORD	FLOW	*	DA MON HRMN	ORD	FLOW

1	0000	1	0.	*	1	0615	76	5408.	*	1	1230	151	7.	*	1	1845	226	0.
1	0005	2	0.	*	1	0620	77	4987.	*	1	1235	152	6.	*	1	1850	227	0.
1	0010	3	0.	*	1	0625	78	4587.	*	1	1240	153	6.	*	1	1855	228	0.
1	0015	4	0.	*	1	0630	79	4210.	*	1	1245	154	5.	*	1	1900	229	0.
1	0020	5	0.	*	1	0635	80	3868.	*	1	1250	155	4.	*	1	1905	230	0.
1	0025	6	0.	*	1	0640	81	3558.	*	1	1255	156	4.	*	1	1910	231	0.
1	0030	7	0.	*	1	0645	82	3278.	*	1	1300	157	4.	*	1	1915	232	0.
1	0035	8	0.	*	1	0650	83	3023.	*	1	1305	158	3.	*	1	1920	233	0.
1	0040	9	0.	*	1	0655	84	2791.	*	1	1310	159	3.	*	1	1925	234	0.
1	0045	10	0.	*	1	0700	85	2580.	*	1	1315	160	2.	*	1	1930	235	0.
1	0050	11	0.	*	1	0705	86	2386.	*	1	1320	161	2.	*	1	1935	236	0.
1	0055	12	0.	*	1	0710	87	2205.	*	1	1325	162	2.	*	1	1940	237	0.
1	0100	13	0.	*	1	0715	88	2040.	*	1	1330	163	2.	*	1	1945	238	0.
1	0105	14	0.	*	1	0720	89	1886.	*	1	1335	164	1.	*	1	1950	239	0.
1	0110	15	0.	*	1	0725	90	1743.	*	1	1340	165	1.	*	1	1955	240	0.
1	0115	16	0.	*	1	0730	91	1611.	*	1	1345	166	1.	*	1	2000	241	0.
1	0120	17	0.	*	1	0735	92	1489.	*	1	1350	167	1.	*	1	2005	242	0.
1	0125	18	0.	*	1	0740	93	1375.	*	1	1355	168	1.	*	1	2010	243	0.
1	0130	19	0.	*	1	0745	94	1271.	*	1	1400	169	1.	*	1	2015	244	0.
1	0135	20	1.	*	1	0750	95	1174.	*	1	1405	170	1.	*	1	2020	245	0.
1	0140	21	1.	*	1	0755	96	1084.	*	1	1410	171	1.	*	1	2025	246	0.
1	0145	22	2.	*	1	0800	97	998.	*	1	1415	172	1.	*	1	2030	247	0.
1	0150	23	4.	*	1	0805	98	916.	*	1	1420	173	0.	*	1	2035	248	0.
1	0155	24	6.	*	1	0810	99	841.	*	1	1425	174	0.	*	1	2040	249	0.
1	0200	25	9.	*	1	0815	100	771.	*	1	1430	175	0.	*	1	2045	250	0.
1	0205	26	12.	*	1	0820	101	707.	*	1	1435	176	0.	*	1	2050	251	0.
1	0210	27	17.	*	1	0825	102	650.	*	1	1440	177	0.	*	1	2055	252	0.
1	0215	28	22.	*	1	0830	103	597.	*	1	1445	178	0.	*	1	2100	253	0.
1	0220	29	30.	*	1	0835	104	550.	*	1	1450	179	0.	*	1	2105	254	0.
1	0225	30	39.	*	1	0840	105	505.	*	1	1455	180	0.	*	1	2110	255	0.
1	0230	31	48.	*	1	0845	106	463.	*	1	1500	181	0.	*	1	2115	256	0.
1	0235	32	59.	*	1	0850	107	424.	*	1	1505	182	0.	*	1	2120	257	0.
1	0240	33	71.	*	1	0855	108	388.	*	1	1510	183	0.	*	1	2125	258	0.
1	0245	34	83.	*	1	0900	109	354.	*	1	1515	184	0.	*	1	2130	259	0.
1	0250	35	96.	*	1	0905	110	323.	*	1	1520	185	0.	*	1	2135	260	0.
1	0255	36	111.	*	1	0910	111	294.	*	1	1525	186	0.	*	1	2140	261	0.
1	0300	37	130.	*	1	0915	112	268.	*	1	1530	187	0.	*	1	2145	262	0.
1	0305	38	154.	*	1	0920	113	245.	*	1	1535	188	0.	*	1	2150	263	0.
1	0310	39	186.	*	1	0925	114	224.	*	1	1540	189	0.	*	1	2155	264	0.
1	0315	40	228.	*	1	0930	115	205.	*	1	1545	190	0.	*	1	2200	265	0.
1	0320	41	287.	*	1	0935	116	188.	*	1	1550	191	0.	*	1	2205	266	0.
1	0325	42	368.	*	1	0940	117	172.	*	1	1555	192	0.	*	1	2210	267	0.
1	0330	43	476.	*	1	0945	118	158.	*	1	1600	193	0.	*	1	2215	268	0.
1	0335	44	619.	*	1	0950	119	146.	*	1	1605	194	0.	*	1	2220	269	0.
1	0340	45	816.	*	1	0955	120	134.	*	1	1610	195	0.	*	1	2225	270	0.
1	0345	46	1076.	*	1	1000	121	123.	*	1	1615	196	0.	*	1	2230	271	0.
1	0350	47	1388.	*	1	1005	122	113.	*	1	1620	197	0.	*	1	2235	272	0.
1	0355	48	1713.	*	1	1010	123	105.	*	1	1625	198	0.	*	1	2240	273	0.
1	0400	49	2018.	*	1	1015	124	96.	*	1	1630	199	0.	*	1	2245	274	0.
1	0405	50	2277.	*	1	1020	125	89.	*	1	1635	200	0.	*	1	2250	275	0.
1	0410	51	2547.	*	1	1025	126	81.	*	1	1640	201	0.	*	1	2255	276	0.
1	0415	52	3868.	*	1	1030	127	75.	*	1	1645	202	0.	*	1	2300	277	0.
1	0420	53	6357.	*	1	1035	128	69.	*	1	1650	203	0.	*	1	2305	278	0.
1	0425	54	7685.	*	1	1040	129	63.	*	1	1655	204	0.	*	1	2310	279	0.
1	0430	55	8223.	*	1	1045	130	57.	*	1	1700	205	0.	*	1	2315	280	0.
1	0435	56	8388.	*	1	1050	131	52.	*	1	1705	206	0.	*	1	2320	281	0.
1	0440	57	8311.	*	1	1055	132	48.	*	1	1710	207	0.	*	1	2325	282	0.
1	0445	58	8170.	*	1	1100	133	43.	*	1	1715	208	0.	*	1	2330	283	0.
1	0450	59	7990.	*	1	1105	134	39.	*	1	1720	209	0.	*	1	2335	284	0.
1	0455	60	7796.	*	1	1110	135	36.	*	1	1725	210	0.	*	1	2340	285	0.
1	0500	61	7586.	*	1	1115	136	32.	*	1	1730	211	0.	*	1	2345	286	0.
1	0505	62	7358.	*	1	1120	137	29.	*	1	1735	212	0.	*	1	2350	287	0.
1	0510	63	7156.	*	1	1125	138	26.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	7027.	*	1	1130	139	24.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	6990.	*	1	1135	140	22.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	7041.	*	1	1140	141	19.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	7155.	*	1	1145	142	18.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	7302.	*	1	1150	143	16.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	7417.	*	1	1155	144	14.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	7434.	*	1	1200	145	13.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	7306.	*	1	1205	146	12.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	7041.	*	1	1210	147	11.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	6685.	*	1	1215	148	10.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	6277.	*	1	1220	149	9.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	5844.	*	1	1225	150	8.	*	1	1840	225	0.	*	2	0055	300	0.

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PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.92-HR

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+   (CFS)       (HR)
                          (CFS)
+    8388.      4.58                 3494.        888.        855.         855.
                        (INCHES)      .552        .561        .561         .561
                         (AC-FT)     1733.       1762.       1762.        1762.

                        CUMULATIVE AREA =   58.84 SQ MI
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HYDROGRAPH AT STATION ULWIN
SUM OF 4 HYDROGRAPHS
PLAN 1, RATIO = .57

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DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	3520.	1		1230	151	12.	1		1845	226	0.
1		0005	2	0.	1		0620	77	3307.	1		1235	152	11.	1		1850	227	0.
1		0010	3	0.	1		0625	78	3097.	1		1240	153	10.	1		1855	228	0.
1		0015	4	0.	1		0630	79	2889.	1		1245	154	9.	1		1900	229	0.
1		0020	5	0.	1		0635	80	2685.	1		1250	155	8.	1		1905	230	0.
1		0025	6	0.	1		0640	81	2487.	1		1255	156	8.	1		1910	231	0.
1		0030	7	0.	1		0645	82	2299.	1		1300	157	7.	1		1915	232	0.
1		0035	8	0.	1		0650	83	2126.	1		1305	158	6.	1		1920	233	0.
1		0040	9	0.	1		0655	84	1968.	1		1310	159	6.	1		1925	234	0.
1		0045	10	0.	1		0700	85	1825.	1		1315	160	5.	1		1930	235	0.
1		0050	11	0.	1		0705	86	1694.	1		1320	161	5.	1		1935	236	0.
1		0055	12	0.	1		0710	87	1573.	1		1325	162	4.	1		1940	237	0.
1		0100	13	0.	1		0715	88	1463.	1		1330	163	4.	1		1945	238	0.
1		0105	14	0.	1		0720	89	1360.	1		1335	164	4.	1		1950	239	0.
1		0110	15	0.	1		0725	90	1266.	1		1340	165	3.	1		1955	240	0.
1		0115	16	0.	1		0730	91	1177.	1		1345	166	3.	1		2000	241	0.
1		0120	17	0.	1		0735	92	1095.	1		1350	167	3.	1		2005	242	0.
1		0125	18	0.	1		0740	93	1019.	1		1355	168	2.	1		2010	243	0.
1		0130	19	0.	1		0745	94	948.	1		1400	169	2.	1		2015	244	0.
1		0135	20	0.	1		0750	95	883.	1		1405	170	2.	1		2020	245	0.
1		0140	21	0.	1		0755	96	822.	1		1410	171	2.	1		2025	246	0.
1		0145	22	0.	1		0800	97	766.	1		1415	172	2.	1		2030	247	0.
1		0150	23	0.	1		0805	98	714.	1		1420	173	1.	1		2035	248	0.
1		0155	24	0.	1		0810	99	665.	1		1425	174	1.	1		2040	249	0.
1		0200	25	0.	1		0815	100	619.	1		1430	175	1.	1		2045	250	0.
1		0205	26	0.	1		0820	101	577.	1		1435	176	1.	1		2050	251	0.
1		0210	27	1.	1		0825	102	539.	1		1440	177	1.	1		2055	252	0.
1		0215	28	2.	1		0830	103	502.	1		1445	178	1.	1		2100	253	0.
1		0220	29	3.	1		0835	104	468.	1		1450	179	1.	1		2105	254	0.
1		0225	30	4.	1		0840	105	435.	1		1455	180	1.	1		2110	255	0.
1		0230	31	6.	1		0845	106	405.	1		1500	181	1.	1		2115	256	0.
1		0235	32	8.	1		0850	107	377.	1		1505	182	1.	1		2120	257	0.
1		0240	33	11.	1		0855	108	350.	1		1510	183	0.	1		2125	258	0.
1		0245	34	13.	1		0900	109	324.	1		1515	184	0.	1		2130	259	0.
1		0250	35	15.	1		0905	110	300.	1		1520	185	0.	1		2135	260	0.
1		0255	36	18.	1		0910	111	278.	1		1525	186	0.	1		2140	261	0.
1		0300	37	20.	1		0915	112	257.	1		1530	187	0.	1		2145	262	0.
1		0305	38	24.	1		0920	113	238.	1		1535	188	0.	1		2150	263	0.
1		0310	39	29.	1		0925	114	220.	1		1540	189	0.	1		2155	264	0.
1		0315	40	36.	1		0930	115	203.	1		1545	190	0.	1		2200	265	0.
1		0320	41	47.	1		0935	116	187.	1		1550	191	0.	1		2205	266	0.
1		0325	42	65.	1		0940	117	172.	1		1555	192	0.	1		2210	267	0.
1		0330	43	92.	1		0945	118	158.	1		1600	193	0.	1		2215	268	0.
1		0335	44	132.	1		0950	119	146.	1		1605	194	0.	1		2220	269	0.
1		0340	45	188.	1		0955	120	134.	1		1610	195	0.	1		2225	270	0.
1		0345	46	259.	1		1000	121	124.	1		1615	196	0.	1		2230	271	0.
1		0350	47	346.	1		1005	122	114.	1		1620	197	0.	1		2235	272	0.
1		0355	48	502.	1		1010	123	106.	1		1625	198	0.	1		2240	273	0.
1		0400	49	705.	1		1015	124	98.	1		1630	199	0.	1		2245	274	0.
1		0405	50	892.	1		1020	125	91.	1		1635	200	0.	1		2250	275	0.
1		0410	51	1033.	1		1025	126	84.	1		1640	201	0.	1		2255	276	0.
1		0415	52	1129.	1		1030	127	78.	1		1645	202	0.	1		2300	277	0.
1		0420	53	1176.	1		1035	128	73.	1		1650	203	0.	1		2305	278	0.
1		0425	54	1196.	1		1040	129	68.	1		1655	204	0.	1		2310	279	0.
1		0430	55	1651.	1		1045	130	63.	1		1700	205	0.	1		2315	280	0.
1		0435	56	4113.	1		1050	131	59.	1		1705	206	0.	1		2320	281	0.
1		0440	57	4559.	1		1055	132	55.	1		1710	207	0.	1		2325	282	0.
1		0445	58	4267.	1		1100	133	51.	1		1715	208	0.	1		2330	283	0.
1		0450	59	4534.	1		1105	134	48.	1		1720	209	0.	1		2335	284	0.
1		0455	60	4244.	1		1110	135	45.	1		1725	210	0.	1		2340	285	0.
1		0500	61	4215.	1		1115	136	42.	1		1730	211	0.	1		2345	286	0.
1		0505	62	4092.	1		1120	137	39.	1		1735	212	0.	1		2350	287	0.

1	0510	63	4001.	*	1	1125	138	36.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	3941.	*	1	1130	139	34.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	3906.	*	1	1135	140	31.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	3912.	*	1	1140	141	29.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	3923.	*	1	1145	142	26.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	3952.	*	1	1150	143	24.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	4012.	*	1	1155	144	22.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	4110.	*	1	1200	145	21.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	4196.	*	1	1205	146	19.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	4195.	*	1	1210	147	17.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	4091.	*	1	1215	148	16.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	3925.	*	1	1220	149	14.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	3730.	*	1	1225	150	13.	*	1	1840	225	0.	*	2	0055	300	0.

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PEAK FLOW (CFS)	TIME (HR)	MAXIMUM AVERAGE FLOW (CFS)	6-HR	24-HR	72-HR	24.92-HR
+ 4559.	4.67		1929.	492.	474.	474.
		(INCHES)	.305	.311	.311	.311
		(AC-FT)	957.	976.	976.	976.

CUMULATIVE AREA = 58.84 SQ MI

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HYDROGRAPH AT STATION ULWIN
SUM OF 4 HYDROGRAPHS
PLAN 1, RATIO = .44

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DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	1981.	1		1230	151	17.	1		1845	226	0.
1		0005	2	0.	1		0620	77	1891.	1		1235	152	16.	1		1850	227	0.
1		0010	3	0.	1		0625	78	1807.	1		1240	153	15.	1		1855	228	0.
1		0015	4	0.	1		0630	79	1702.	1		1245	154	14.	1		1900	229	0.
1		0020	5	0.	1		0635	80	1600.	1		1250	155	13.	1		1905	230	0.
1		0025	6	0.	1		0640	81	1514.	1		1255	156	12.	1		1910	231	0.
1		0030	7	0.	1		0645	82	1445.	1		1300	157	11.	1		1915	232	0.
1		0035	8	0.	1		0650	83	1367.	1		1305	158	10.	1		1920	233	0.
1		0040	9	0.	1		0655	84	1280.	1		1310	159	9.	1		1925	234	0.
1		0045	10	0.	1		0700	85	1202.	1		1315	160	9.	1		1930	235	0.
1		0050	11	0.	1		0705	86	1128.	1		1320	161	8.	1		1935	236	0.
1		0055	12	0.	1		0710	87	1049.	1		1325	162	7.	1		1940	237	0.
1		0100	13	0.	1		0715	88	973.	1		1330	163	7.	1		1945	238	0.
1		0105	14	0.	1		0720	89	910.	1		1335	164	6.	1		1950	239	0.
1		0110	15	0.	1		0725	90	851.	1		1340	165	6.	1		1955	240	0.
1		0115	16	0.	1		0730	91	794.	1		1345	166	5.	1		2000	241	0.
1		0120	17	0.	1		0735	92	745.	1		1350	167	5.	1		2005	242	0.
1		0125	18	0.	1		0740	93	701.	1		1355	168	5.	1		2010	243	0.
1		0130	19	0.	1		0745	94	657.	1		1400	169	4.	1		2015	244	0.
1		0135	20	0.	1		0750	95	617.	1		1405	170	4.	1		2020	245	0.
1		0140	21	0.	1		0755	96	581.	1		1410	171	4.	1		2025	246	0.
1		0145	22	0.	1		0800	97	544.	1		1415	172	3.	1		2030	247	0.
1		0150	23	0.	1		0805	98	511.	1		1420	173	3.	1		2035	248	0.
1		0155	24	0.	1		0810	99	481.	1		1425	174	3.	1		2040	249	0.
1		0200	25	0.	1		0815	100	451.	1		1430	175	3.	1		2045	250	0.
1		0205	26	0.	1		0820	101	424.	1		1435	176	3.	1		2050	251	0.
1		0210	27	0.	1		0825	102	399.	1		1440	177	2.	1		2055	252	0.
1		0215	28	0.	1		0830	103	375.	1		1445	178	2.	1		2100	253	0.
1		0220	29	0.	1		0835	104	353.	1		1450	179	2.	1		2105	254	0.
1		0225	30	0.	1		0840	105	332.	1		1455	180	2.	1		2110	255	0.
1		0230	31	0.	1		0845	106	313.	1		1500	181	2.	1		2115	256	0.
1		0235	32	0.	1		0850	107	295.	1		1505	182	2.	1		2120	257	0.
1		0240	33	0.	1		0855	108	277.	1		1510	183	2.	1		2125	258	0.
1		0245	34	0.	1		0900	109	261.	1		1515	184	1.	1		2130	259	0.
1		0250	35	0.	1		0905	110	246.	1		1520	185	1.	1		2135	260	0.
1		0255	36	0.	1		0910	111	233.	1		1525	186	1.	1		2140	261	0.
1		0300	37	1.	1		0915	112	220.	1		1530	187	1.	1		2145	262	0.
1		0305	38	1.	1		0920	113	207.	1		1535	188	1.	1		2150	263	0.
1		0310	39	1.	1		0925	114	196.	1		1540	189	1.	1		2155	264	0.
1		0315	40	2.	1		0930	115	184.	1		1545	190	1.	1		2200	265	0.
1		0320	41	4.	1		0935	116	172.	1		1550	191	1.	1		2205	266	0.
1		0325	42	7.	1		0940	117	161.	1		1555	192	1.	1		2210	267	0.
1		0330	43	15.	1		0945	118	151.	1		1600	193	1.	1		2215	268	0.
1		0335	44	29.	1		0950	119	141.	1		1605	194	1.	1		2220	269	0.

1	0340	45	51.	*	1	0955	120	131.	*	1	1610	195	1.	*	1	2225	270	0.
1	0345	46	80.	*	1	1000	121	123.	*	1	1615	196	1.	*	1	2230	271	0.
1	0350	47	114.	*	1	1005	122	114.	*	1	1620	197	0.	*	1	2235	272	0.
1	0355	48	150.	*	1	1010	123	107.	*	1	1625	198	0.	*	1	2240	273	0.
1	0400	49	187.	*	1	1015	124	100.	*	1	1630	199	0.	*	1	2245	274	0.
1	0405	50	227.	*	1	1020	125	93.	*	1	1635	200	0.	*	1	2250	275	0.
1	0410	51	331.	*	1	1025	126	87.	*	1	1640	201	0.	*	1	2255	276	0.
1	0415	52	435.	*	1	1030	127	81.	*	1	1645	202	0.	*	1	2300	277	0.
1	0420	53	476.	*	1	1035	128	76.	*	1	1650	203	0.	*	1	2305	278	0.
1	0425	54	502.	*	1	1040	129	70.	*	1	1655	204	0.	*	1	2310	279	0.
1	0430	55	505.	*	1	1045	130	66.	*	1	1700	205	0.	*	1	2315	280	0.
1	0435	56	499.	*	1	1050	131	61.	*	1	1705	206	0.	*	1	2320	281	0.
1	0440	57	487.	*	1	1055	132	57.	*	1	1710	207	0.	*	1	2325	282	0.
1	0445	58	473.	*	1	1100	133	53.	*	1	1715	208	0.	*	1	2330	283	0.
1	0450	59	463.	*	1	1105	134	50.	*	1	1720	209	0.	*	1	2335	284	0.
1	0455	60	1854.	*	1	1110	135	47.	*	1	1725	210	0.	*	1	2340	285	0.
1	0500	61	2764.	*	1	1115	136	44.	*	1	1730	211	0.	*	1	2345	286	0.
1	0505	62	1699.	*	1	1120	137	41.	*	1	1735	212	0.	*	1	2350	287	0.
1	0510	63	2251.	*	1	1125	138	38.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	2295.	*	1	1130	139	36.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	1929.	*	1	1135	140	34.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	2191.	*	1	1140	141	32.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	2000.	*	1	1145	142	30.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	1974.	*	1	1150	143	28.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	1998.	*	1	1155	144	26.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	1935.	*	1	1200	145	25.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	2039.	*	1	1205	146	23.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	2068.	*	1	1210	147	22.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	2145.	*	1	1215	148	20.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	2151.	*	1	1220	149	19.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	2080.	*	1	1225	150	18.	*	1	1840	225	0.	*	2	0055	300	0.

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PEAK FLOW (CFS)	TIME (HR)	MAXIMUM AVERAGE FLOW (CFS)	6-HR	24-HR	72-HR	24.92-HR
+ 2764.	5.00		970.	250.	241.	241.
		(INCHES)	.153	.158	.158	.158
		(AC-FT)	481.	497.	497.	497.

CUMULATIVE AREA = 58.84 SQ MI

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HYDROGRAPH AT STATION ULWIN
SUM OF 4 HYDROGRAPHS
PLAN 1, RATIO = .26

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DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	125.	1		1230	151	12.	1		1845	226	0.
1		0005	2	0.	1		0620	77	446.	1		1235	152	12.	1		1850	227	0.
1		0010	3	0.	1		0625	78	315.	1		1240	153	11.	1		1855	228	0.
1		0015	4	0.	1		0630	79	243.	1		1245	154	10.	1		1900	229	0.
1		0020	5	0.	1		0635	80	500.	1		1250	155	10.	1		1905	230	0.
1		0025	6	0.	1		0640	81	373.	1		1255	156	9.	1		1910	231	0.
1		0030	7	0.	1		0645	82	393.	1		1300	157	9.	1		1915	232	0.
1		0035	8	0.	1		0650	83	479.	1		1305	158	8.	1		1920	233	0.
1		0040	9	0.	1		0655	84	344.	1		1310	159	8.	1		1925	234	0.
1		0045	10	0.	1		0700	85	412.	1		1315	160	7.	1		1930	235	0.
1		0050	11	0.	1		0705	86	370.	1		1320	161	7.	1		1935	236	0.
1		0055	12	0.	1		0710	87	308.	1		1325	162	7.	1		1940	237	0.
1		0100	13	0.	1		0715	88	362.	1		1330	163	6.	1		1945	238	0.
1		0105	14	0.	1		0720	89	295.	1		1335	164	6.	1		1950	239	0.
1		0110	15	0.	1		0725	90	294.	1		1340	165	6.	1		1955	240	0.
1		0115	16	0.	1		0730	91	293.	1		1345	166	5.	1		2000	241	0.
1		0120	17	0.	1		0735	92	258.	1		1350	167	5.	1		2005	242	0.
1		0125	18	0.	1		0740	93	259.	1		1355	168	5.	1		2010	243	0.
1		0130	19	0.	1		0745	94	239.	1		1400	169	5.	1		2015	244	0.
1		0135	20	0.	1		0750	95	226.	1		1405	170	4.	1		2020	245	0.
1		0140	21	0.	1		0755	96	220.	1		1410	171	4.	1		2025	246	0.
1		0145	22	0.	1		0800	97	209.	1		1415	172	4.	1		2030	247	0.
1		0150	23	0.	1		0805	98	192.	1		1420	173	4.	1		2035	248	0.
1		0155	24	0.	1		0810	99	193.	1		1425	174	4.	1		2040	249	0.
1		0200	25	0.	1		0815	100	178.	1		1430	175	4.	1		2045	250	0.
1		0205	26	0.	1		0820	101	165.	1		1435	176	3.	1		2050	251	0.

1	0210	27	0.	*	1	0825	102	161.	*	1	1440	177	3.	*	1	2055	252	0.
1	0215	28	0.	*	1	0830	103	144.	*	1	1445	178	3.	*	1	2100	253	0.
1	0220	29	0.	*	1	0835	104	139.	*	1	1450	179	3.	*	1	2105	254	0.
1	0225	30	0.	*	1	0840	105	129.	*	1	1455	180	3.	*	1	2110	255	0.
1	0230	31	0.	*	1	0845	106	124.	*	1	1500	181	3.	*	1	2115	256	0.
1	0235	32	0.	*	1	0850	107	121.	*	1	1505	182	3.	*	1	2120	257	0.
1	0240	33	0.	*	1	0855	108	114.	*	1	1510	183	2.	*	1	2125	258	0.
1	0245	34	0.	*	1	0900	109	111.	*	1	1515	184	2.	*	1	2130	259	0.
1	0250	35	0.	*	1	0905	110	104.	*	1	1520	185	2.	*	1	2135	260	0.
1	0255	36	0.	*	1	0910	111	96.	*	1	1525	186	2.	*	1	2140	261	0.
1	0300	37	0.	*	1	0915	112	90.	*	1	1530	187	2.	*	1	2145	262	0.
1	0305	38	0.	*	1	0920	113	86.	*	1	1535	188	2.	*	1	2150	263	0.
1	0310	39	0.	*	1	0925	114	85.	*	1	1540	189	2.	*	1	2155	264	0.
1	0315	40	0.	*	1	0930	115	84.	*	1	1545	190	2.	*	1	2200	265	0.
1	0320	41	0.	*	1	0935	116	82.	*	1	1550	191	1.	*	1	2205	266	0.
1	0325	42	0.	*	1	0940	117	77.	*	1	1555	192	1.	*	1	2210	267	0.
1	0330	43	0.	*	1	0945	118	72.	*	1	1600	193	1.	*	1	2215	268	0.
1	0335	44	0.	*	1	0950	119	69.	*	1	1605	194	1.	*	1	2220	269	0.
1	0340	45	0.	*	1	0955	120	66.	*	1	1610	195	1.	*	1	2225	270	0.
1	0345	46	0.	*	1	1000	121	63.	*	1	1615	196	1.	*	1	2230	271	0.
1	0350	47	0.	*	1	1005	122	60.	*	1	1620	197	1.	*	1	2235	272	0.
1	0355	48	1.	*	1	1010	123	56.	*	1	1625	198	1.	*	1	2240	273	0.
1	0400	49	5.	*	1	1015	124	53.	*	1	1630	199	1.	*	1	2245	274	0.
1	0405	50	11.	*	1	1020	125	50.	*	1	1635	200	1.	*	1	2250	275	0.
1	0410	51	19.	*	1	1025	126	48.	*	1	1640	201	1.	*	1	2255	276	0.
1	0415	52	26.	*	1	1030	127	47.	*	1	1645	202	1.	*	1	2300	277	0.
1	0420	53	32.	*	1	1035	128	45.	*	1	1650	203	1.	*	1	2305	278	0.
1	0425	54	36.	*	1	1040	129	43.	*	1	1655	204	1.	*	1	2310	279	0.
1	0430	55	40.	*	1	1045	130	41.	*	1	1700	205	1.	*	1	2315	280	0.
1	0435	56	43.	*	1	1050	131	39.	*	1	1705	206	1.	*	1	2320	281	0.
1	0440	57	44.	*	1	1055	132	37.	*	1	1710	207	1.	*	1	2325	282	0.
1	0445	58	46.	*	1	1100	133	36.	*	1	1715	208	1.	*	1	2330	283	0.
1	0450	59	53.	*	1	1105	134	34.	*	1	1720	209	1.	*	1	2335	284	0.
1	0455	60	72.	*	1	1110	135	32.	*	1	1725	210	1.	*	1	2340	285	0.
1	0500	61	68.	*	1	1115	136	30.	*	1	1730	211	0.	*	1	2345	286	0.
1	0505	62	70.	*	1	1120	137	29.	*	1	1735	212	0.	*	1	2350	287	0.
1	0510	63	77.	*	1	1125	138	27.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	77.	*	1	1130	139	25.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	81.	*	1	1135	140	24.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	84.	*	1	1140	141	23.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	88.	*	1	1145	142	21.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	93.	*	1	1150	143	20.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	99.	*	1	1155	144	19.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	105.	*	1	1200	145	18.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	105.	*	1	1205	146	17.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	101.	*	1	1210	147	16.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	95.	*	1	1215	148	15.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	87.	*	1	1220	149	14.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	79.	*	1	1225	150	13.	*	1	1840	225	0.	*	2	0055	300	0.

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PEAK FLOW (CFS)	TIME (HR)	MAXIMUM AVERAGE FLOW (CFS)	6-HR	24-HR	72-HR	24.92-HR
+ 500.	6.58		161.	44.	42.	42.
		(INCHES)	.025	.028	.028	.028
		(AC-FT)	80.	87.	87.	87.

CUMULATIVE AREA = 58.84 SQ MI

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            **************
            *            *
1305 KK     *    FINISH  *
            *            *
            **************

1307 KO          OUTPUT CONTROL VARIABLES
                       IPRNT           1  PRINT CONTROL
                       IPLOT           0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE

                HYDROGRAPH ROUTING DATA
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1306 RD MUSKINGUM-CUNGE CHANNEL ROUTING

L	1500.	CHANNEL LENGTH
S	.0090	SLOPE
N	.050	CHANNEL ROUGHNESS COEFFICIENT
CA	.00	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	250.00	BOTTOM WIDTH OR DIAMETER
Z	3.00	SIDE SLOPE

***

COMPUTED MUSKINGUM-CUNGE PARAMETERS

ELEMENT	ALPHA	M	COMPUTATION TIME STEP DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	.08	1.64	2.55	750.00	10209.02	323.76	1.10	9.81
INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL								
MAIN	.08	1.64	5.00		10207.58	325.00	1.10	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5207E+04 EXCESS= .0000E+00 OUTFLOW= .5207E+04 BASIN STORAGE= .1055E-01 PERCENT ERROR= .0

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HYDROGRAPH AT STATION FINISH
PLAN 1, RATIO = 1.00

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DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	9253.	1		1230	151	2692.	1		1845	226	200.
1		0005	2	0.	1		0620	77	9553.	1		1235	152	2669.	1		1850	227	162.
1		0010	3	0.	1		0625	78	9698.	1		1240	153	2645.	1		1855	228	126.
1		0015	4	0.	1		0630	79	9707.	1		1245	154	2621.	1		1900	229	96.
1		0020	5	0.	1		0635	80	9614.	1		1250	155	2597.	1		1905	230	72.
1		0025	6	0.	1		0640	81	9438.	1		1255	156	2573.	1		1910	231	54.
1		0030	7	0.	1		0645	82	9202.	1		1300	157	2549.	1		1915	232	40.
1		0035	8	1.	1		0650	83	8924.	1		1305	158	2526.	1		1920	233	30.
1		0040	9	3.	1		0655	84	8614.	1		1310	159	2503.	1		1925	234	22.
1		0045	10	6.	1		0700	85	8282.	1		1315	160	2478.	1		1930	235	17.
1		0050	11	11.	1		0705	86	7935.	1		1320	161	2453.	1		1935	236	13.
1		0055	12	19.	1		0710	87	7580.	1		1325	162	2427.	1		1940	237	9.
1		0100	13	29.	1		0715	88	7223.	1		1330	163	2401.	1		1945	238	7.
1		0105	14	42.	1		0720	89	6867.	1		1335	164	2376.	1		1950	239	5.
1		0110	15	58.	1		0725	90	6514.	1		1340	165	2351.	1		1955	240	4.
1		0115	16	74.	1		0730	91	6166.	1		1345	166	2326.	1		2000	241	3.
1		0120	17	92.	1		0735	92	5823.	1		1350	167	2300.	1		2005	242	2.
1		0125	18	111.	1		0740	93	5491.	1		1355	168	2272.	1		2010	243	2.
1		0130	19	131.	1		0745	94	5176.	1		1400	169	2244.	1		2015	244	1.
1		0135	20	153.	1		0750	95	4903.	1		1405	170	2216.	1		2020	245	1.
1		0140	21	178.	1		0755	96	4697.	1		1410	171	2188.	1		2025	246	1.
1		0145	22	208.	1		0800	97	4560.	1		1415	172	2161.	1		2030	247	0.
1		0150	23	244.	1		0805	98	4464.	1		1420	173	2134.	1		2035	248	0.
1		0155	24	286.	1		0810	99	4381.	1		1425	174	2105.	1		2040	249	0.
1		0200	25	335.	1		0815	100	4305.	1		1430	175	2075.	1		2045	250	0.
1		0205	26	391.	1		0820	101	4233.	1		1435	176	2043.	1		2050	251	0.
1		0210	27	454.	1		0825	102	4165.	1		1440	177	2012.	1		2055	252	0.
1		0215	28	522.	1		0830	103	4100.	1		1445	178	1981.	1		2100	253	0.
1		0220	29	594.	1		0835	104	4039.	1		1450	179	1950.	1		2105	254	0.
1		0225	30	668.	1		0840	105	3981.	1		1455	180	1919.	1		2110	255	0.
1		0230	31	745.	1		0845	106	3927.	1		1500	181	1886.	1		2115	256	0.
1		0235	32	821.	1		0850	107	3875.	1		1505	182	1852.	1		2120	257	0.
1		0240	33	894.	1		0855	108	3826.	1		1510	183	1816.	1		2125	258	0.
1		0245	34	960.	1		0900	109	3780.	1		1515	184	1781.	1		2130	259	0.
1		0250	35	1015.	1		0905	110	3736.	1		1520	185	1747.	1		2135	260	0.
1		0255	36	1065.	1		0910	111	3695.	1		1525	186	1712.	1		2140	261	0.
1		0300	37	1122.	1		0915	112	3656.	1		1530	187	1677.	1		2145	262	0.
1		0305	38	1200.	1		0920	113	3620.	1		1535	188	1640.	1		2150	263	0.
1		0310	39	1312.	1		0925	114	3585.	1		1540	189	1603.	1		2155	264	0.
1		0315	40	1477.	1		0930	115	3552.	1		1545	190	1566.	1		2200	265	0.
1		0320	41	1713.	1		0935	116	3519.	1		1550	191	1530.	1		2205	266	0.
1		0325	42	2033.	1		0940	117	3487.	1		1555	192	1494.	1		2210	267	0.
1		0330	43	2456.	1		0945	118	3457.	1		1600	193	1458.	1		2215	268	0.

1	0335	44	3006.	*	1	0950	119	3427.	*	1	1605	194	1419.	*	1	2220	269	0.
1	0340	45	3677.	*	1	0955	120	3399.	*	1	1610	195	1381.	*	1	2225	270	0.
1	0345	46	4432.	*	1	1000	121	3371.	*	1	1615	196	1343.	*	1	2230	271	0.
1	0350	47	5240.	*	1	1005	122	3345.	*	1	1620	197	1306.	*	1	2235	272	0.
1	0355	48	6061.	*	1	1010	123	3319.	*	1	1625	198	1269.	*	1	2240	273	0.
1	0400	49	6824.	*	1	1015	124	3295.	*	1	1630	199	1232.	*	1	2245	274	0.
1	0405	50	7472.	*	1	1020	125	3271.	*	1	1635	200	1193.	*	1	2250	275	0.
1	0410	51	7998.	*	1	1025	126	3247.	*	1	1640	201	1153.	*	1	2255	276	0.
1	0415	52	8426.	*	1	1030	127	3222.	*	1	1645	202	1114.	*	1	2300	277	0.
1	0420	53	8768.	*	1	1035	128	3198.	*	1	1650	203	1076.	*	1	2305	278	0.
1	0425	54	9014.	*	1	1040	129	3174.	*	1	1655	204	1039.	*	1	2310	279	0.
1	0430	55	9160.	*	1	1045	130	3151.	*	1	1700	205	1002.	*	1	2315	280	0.
1	0435	56	9229.	*	1	1050	131	3129.	*	1	1705	206	964.	*	1	2320	281	0.
1	0440	57	9252.	*	1	1055	132	3107.	*	1	1710	207	924.	*	1	2325	282	0.
1	0445	58	9258.	*	1	1100	133	3086.	*	1	1715	208	885.	*	1	2330	283	0.
1	0450	59	9291.	*	1	1105	134	3065.	*	1	1720	209	847.	*	1	2335	284	0.
1	0455	60	9389.	*	1	1110	135	3044.	*	1	1725	210	811.	*	1	2340	285	0.
1	0500	61	9546.	*	1	1115	136	3022.	*	1	1730	211	776.	*	1	2345	286	0.
1	0505	62	9730.	*	1	1120	137	3000.	*	1	1735	212	740.	*	1	2350	287	0.
1	0510	63	9912.	*	1	1125	138	2977.	*	1	1740	213	701.	*	1	2355	288	0.
1	0515	64	10070.	*	1	1130	139	2955.	*	1	1745	214	661.	*	2	0000	289	0.
1	0520	65	10175.	*	1	1135	140	2934.	*	1	1750	215	622.	*	2	0005	290	0.
1	0525	66	10208.	*	1	1140	141	2913.	*	1	1755	216	584.	*	2	0010	291	0.
1	0530	67	10166.	*	1	1145	142	2892.	*	1	1800	217	548.	*	2	0015	292	0.
1	0535	68	10059.	*	1	1150	143	2871.	*	1	1805	218	512.	*	2	0020	293	0.
1	0540	69	9894.	*	1	1155	144	2849.	*	1	1810	219	475.	*	2	0025	294	0.
1	0545	70	9681.	*	1	1200	145	2826.	*	1	1815	220	431.	*	2	0030	295	0.
1	0550	71	9435.	*	1	1205	146	2803.	*	1	1820	221	385.	*	2	0035	296	0.
1	0555	72	9174.	*	1	1210	147	2781.	*	1	1825	222	342.	*	2	0040	297	0.
1	0600	73	8935.	*	1	1215	148	2758.	*	1	1830	223	302.	*	2	0045	298	0.
1	0605	74	8814.	*	1	1220	149	2736.	*	1	1835	224	266.	*	2	0050	299	0.
1	0610	75	8933.	*	1	1225	150	2714.	*	1	1840	225	234.	*	2	0055	300	0.

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PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)				
		(CFS)			
+ 10208.	5.42	7053.	2625.	2529.	2529.
		(INCHES) .738	1.099	1.099	1.099
		(AC-FT) 3497.	5207.	5207.	5207.

CUMULATIVE AREA = 88.86 SQ MI

COMPUTED MUSKINGUM-CUNGE PARAMETERS

ELEMENT	ALPHA	M	COMPUTATION TIME STEP DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	.08	1.64	2.75	750.00	8433.52	326.69	.85	9.11
			INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL					
MAIN	.08	1.64	5.00		8427.54	325.00	.85	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4014E+04 EXCESS= .0000E+00 OUTFLOW= .4014E+04 BASIN STORAGE= .1199E-01 PERCENT ERROR= .0

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HYDROGRAPH AT STATION FINISH
PLAN 1, RATIO = .87

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DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	6884.	1		1230	151	2272.	1		1845	226	2.
1		0005	2	0.	1		0620	77	6701.	1		1235	152	2243.	1		1850	227	2.
1		0010	3	0.	1		0625	78	6524.	1		1240	153	2214.	1		1855	228	1.
1		0015	4	0.	1		0630	79	6351.	1		1245	154	2186.	1		1900	229	1.
1		0020	5	0.	1		0635	80	6184.	1		1250	155	2157.	1		1905	230	1.
1		0025	6	0.	1		0640	81	6019.	1		1255	156	2129.	1		1910	231	0.
1		0030	7	0.	1		0645	82	5860.	1		1300	157	2098.	1		1915	232	0.
1		0035	8	0.	1		0650	83	5706.	1		1305	158	2067.	1		1920	233	0.

1	0040	9	0.	*	1	0655	84	5558.	*	1	1310	159	2034.	*	1	1925	234	0.
1	0045	10	1.	*	1	0700	85	5415.	*	1	1315	160	2003.	*	1	1930	235	0.
1	0050	11	2.	*	1	0705	86	5279.	*	1	1320	161	1971.	*	1	1935	236	0.
1	0055	12	4.	*	1	0710	87	5148.	*	1	1325	162	1940.	*	1	1940	237	0.
1	0100	13	7.	*	1	0715	88	5024.	*	1	1330	163	1907.	*	1	1945	238	0.
1	0105	14	11.	*	1	0720	89	4906.	*	1	1335	164	1873.	*	1	1950	239	0.
1	0110	15	17.	*	1	0725	90	4793.	*	1	1340	165	1837.	*	1	1955	240	0.
1	0115	16	24.	*	1	0730	91	4684.	*	1	1345	166	1801.	*	1	2000	241	0.
1	0120	17	31.	*	1	0735	92	4579.	*	1	1350	167	1766.	*	1	2005	242	0.
1	0125	18	40.	*	1	0740	93	4477.	*	1	1355	168	1732.	*	1	2010	243	0.
1	0130	19	50.	*	1	0745	94	4380.	*	1	1400	169	1697.	*	1	2015	244	0.
1	0135	20	62.	*	1	0750	95	4288.	*	1	1405	170	1660.	*	1	2020	245	0.
1	0140	21	77.	*	1	0755	96	4202.	*	1	1410	171	1622.	*	1	2025	246	0.
1	0145	22	95.	*	1	0800	97	4121.	*	1	1415	172	1585.	*	1	2030	247	0.
1	0150	23	117.	*	1	0805	98	4046.	*	1	1420	173	1548.	*	1	2035	248	0.
1	0155	24	144.	*	1	0810	99	3977.	*	1	1425	174	1512.	*	1	2040	249	0.
1	0200	25	176.	*	1	0815	100	3912.	*	1	1430	175	1476.	*	1	2045	250	0.
1	0205	26	213.	*	1	0820	101	3850.	*	1	1435	176	1439.	*	1	2050	251	0.
1	0210	27	254.	*	1	0825	102	3792.	*	1	1440	177	1400.	*	1	2055	252	0.
1	0215	28	299.	*	1	0830	103	3737.	*	1	1445	178	1361.	*	1	2100	253	0.
1	0220	29	347.	*	1	0835	104	3685.	*	1	1450	179	1324.	*	1	2105	254	0.
1	0225	30	395.	*	1	0840	105	3636.	*	1	1455	180	1287.	*	1	2110	255	0.
1	0230	31	443.	*	1	0845	106	3588.	*	1	1500	181	1250.	*	1	2115	256	0.
1	0235	32	489.	*	1	0850	107	3542.	*	1	1505	182	1212.	*	1	2120	257	0.
1	0240	33	530.	*	1	0855	108	3498.	*	1	1510	183	1173.	*	1	2125	258	0.
1	0245	34	566.	*	1	0900	109	3455.	*	1	1515	184	1133.	*	1	2130	259	0.
1	0250	35	599.	*	1	0905	110	3415.	*	1	1520	185	1094.	*	1	2135	260	0.
1	0255	36	633.	*	1	0910	111	3376.	*	1	1525	186	1057.	*	1	2140	261	0.
1	0300	37	674.	*	1	0915	112	3339.	*	1	1530	187	1021.	*	1	2145	262	0.
1	0305	38	730.	*	1	0920	113	3304.	*	1	1535	188	983.	*	1	2150	263	0.
1	0310	39	808.	*	1	0925	114	3271.	*	1	1540	189	944.	*	1	2155	264	0.
1	0315	40	918.	*	1	0930	115	3239.	*	1	1545	190	904.	*	1	2200	265	0.
1	0320	41	1074.	*	1	0935	116	3207.	*	1	1550	191	865.	*	1	2205	266	0.
1	0325	42	1293.	*	1	0940	117	3177.	*	1	1555	192	828.	*	1	2210	267	0.
1	0330	43	1600.	*	1	0945	118	3146.	*	1	1600	193	793.	*	1	2215	268	0.
1	0335	44	2020.	*	1	0950	119	3116.	*	1	1605	194	757.	*	1	2220	269	0.
1	0340	45	2554.	*	1	0955	120	3086.	*	1	1610	195	719.	*	1	2225	270	0.
1	0345	46	3166.	*	1	1000	121	3057.	*	1	1615	196	680.	*	1	2230	271	0.
1	0350	47	3828.	*	1	1005	122	3029.	*	1	1620	197	641.	*	1	2235	272	0.
1	0355	48	4500.	*	1	1010	123	3002.	*	1	1625	198	604.	*	1	2240	273	0.
1	0400	49	5130.	*	1	1015	124	2976.	*	1	1630	199	568.	*	1	2245	274	0.
1	0405	50	5671.	*	1	1020	125	2950.	*	1	1635	200	534.	*	1	2250	275	0.
1	0410	51	6107.	*	1	1025	126	2923.	*	1	1640	201	501.	*	1	2255	276	0.
1	0415	52	6448.	*	1	1030	127	2897.	*	1	1645	202	465.	*	1	2300	277	0.
1	0420	53	6717.	*	1	1035	128	2870.	*	1	1650	203	423.	*	1	2305	278	0.
1	0425	54	6931.	*	1	1040	129	2844.	*	1	1655	204	380.	*	1	2310	279	0.
1	0430	55	7099.	*	1	1045	130	2818.	*	1	1700	205	338.	*	1	2315	280	0.
1	0435	56	7228.	*	1	1050	131	2793.	*	1	1705	206	301.	*	1	2320	281	0.
1	0440	57	7322.	*	1	1055	132	2768.	*	1	1710	207	268.	*	1	2325	282	0.
1	0445	58	7386.	*	1	1100	133	2744.	*	1	1715	208	236.	*	1	2330	283	0.
1	0450	59	7459.	*	1	1105	134	2719.	*	1	1720	209	203.	*	1	2335	284	0.
1	0455	60	7576.	*	1	1110	135	2693.	*	1	1725	210	167.	*	1	2340	285	0.
1	0500	61	7740.	*	1	1115	136	2667.	*	1	1730	211	131.	*	1	2345	286	0.
1	0505	62	7923.	*	1	1120	137	2642.	*	1	1735	212	101.	*	1	2350	287	0.
1	0510	63	8103.	*	1	1125	138	2616.	*	1	1740	213	76.	*	1	2355	288	0.
1	0515	64	8262.	*	1	1130	139	2591.	*	1	1745	214	57.	*	2	0000	289	0.
1	0520	65	8376.	*	1	1135	140	2566.	*	1	1750	215	43.	*	2	0005	290	0.
1	0525	66	8428.	*	1	1140	141	2541.	*	1	1755	216	33.	*	2	0010	291	0.
1	0530	67	8417.	*	1	1145	142	2515.	*	1	1800	217	25.	*	2	0015	292	0.
1	0535	68	8352.	*	1	1150	143	2489.	*	1	1805	218	19.	*	2	0020	293	0.
1	0540	69	8237.	*	1	1155	144	2462.	*	1	1810	219	14.	*	2	0025	294	0.
1	0545	70	8083.	*	1	1200	145	2435.	*	1	1815	220	11.	*	2	0030	295	0.
1	0550	71	7901.	*	1	1205	146	2408.	*	1	1820	221	8.	*	2	0035	296	0.
1	0555	72	7701.	*	1	1210	147	2381.	*	1	1825	222	6.	*	2	0040	297	0.
1	0600	73	7494.	*	1	1215	148	2355.	*	1	1830	223	5.	*	2	0045	298	0.
1	0605	74	7284.	*	1	1220	149	2328.	*	1	1835	224	4.	*	2	0050	299	0.
1	0610	75	7078.	*	1	1225	150	2301.	*	1	1840	225	3.	*	2	0055	300	0.
				*					*					*				

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 8428.	5.42		5557.	2024.	1949.	1949.
		(INCHES)	.581	.847	.847	.847
		(AC-FT)	2755.	4014.	4014.	4014.

CUMULATIVE AREA = 88.86 SQ MI

COMPUTED MUSKINGUM-CUNGE PARAMETERS

ELEMENT	ALPHA	COMPUTATION TIME STEP M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	.08	1.64	3.02	750.00	6621.68	328.78	.61	8.29

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

MAIN	.08	1.64	5.00		6619.14	330.00	.61	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2913E+04 EXCESS= .0000E+00 OUTFLOW= .2913E+04 BASIN STORAGE= .1112E-01 PERCENT ERROR= .0

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HYDROGRAPH AT STATION FINISH
PLAN 1, RATIO = .74

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DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	5580.	1		1230	151	1448.	1		1845	226	0.
1		0005	2	0.	1		0620	77	5451.	1		1235	152	1408.	1		1850	227	0.
1		0010	3	0.	1		0625	78	5326.	1		1240	153	1369.	1		1855	228	0.
1		0015	4	0.	1		0630	79	5203.	1		1245	154	1331.	1		1900	229	0.
1		0020	5	0.	1		0635	80	5082.	1		1250	155	1293.	1		1905	230	0.
1		0025	6	0.	1		0640	81	4961.	1		1255	156	1256.	1		1910	231	0.
1		0030	7	0.	1		0645	82	4842.	1		1300	157	1217.	1		1915	232	0.
1		0035	8	0.	1		0650	83	4726.	1		1305	158	1177.	1		1920	233	0.
1		0040	9	0.	1		0655	84	4615.	1		1310	159	1137.	1		1925	234	0.
1		0045	10	0.	1		0700	85	4507.	1		1315	160	1098.	1		1930	235	0.
1		0050	11	0.	1		0705	86	4402.	1		1320	161	1060.	1		1935	236	0.
1		0055	12	0.	1		0710	87	4302.	1		1325	162	1023.	1		1940	237	0.
1		0100	13	0.	1		0715	88	4207.	1		1330	163	985.	1		1945	238	0.
1		0105	14	1.	1		0720	89	4115.	1		1335	164	946.	1		1950	239	0.
1		0110	15	2.	1		0725	90	4027.	1		1340	165	905.	1		1955	240	0.
1		0115	16	3.	1		0730	91	3942.	1		1345	166	867.	1		2000	241	0.
1		0120	17	5.	1		0735	92	3860.	1		1350	167	829.	1		2005	242	0.
1		0125	18	7.	1		0740	93	3779.	1		1355	168	793.	1		2010	243	0.
1		0130	19	10.	1		0745	94	3702.	1		1400	169	757.	1		2015	244	0.
1		0135	20	14.	1		0750	95	3627.	1		1405	170	720.	1		2020	245	0.
1		0140	21	20.	1		0755	96	3557.	1		1410	171	681.	1		2025	246	0.
1		0145	22	28.	1		0800	97	3490.	1		1415	172	641.	1		2030	247	0.
1		0150	23	38.	1		0805	98	3427.	1		1420	173	604.	1		2035	248	0.
1		0155	24	51.	1		0810	99	3367.	1		1425	174	568.	1		2040	249	0.
1		0200	25	68.	1		0815	100	3312.	1		1430	175	535.	1		2045	250	0.
1		0205	26	88.	1		0820	101	3258.	1		1435	176	501.	1		2050	251	0.
1		0210	27	112.	1		0825	102	3207.	1		1440	177	466.	1		2055	252	0.
1		0215	28	138.	1		0830	103	3159.	1		1445	178	427.	1		2100	253	0.
1		0220	29	167.	1		0835	104	3112.	1		1450	179	386.	1		2105	254	0.
1		0225	30	197.	1		0840	105	3067.	1		1455	180	346.	1		2110	255	0.
1		0230	31	228.	1		0845	106	3024.	1		1500	181	309.	1		2115	256	0.
1		0235	32	256.	1		0850	107	2981.	1		1505	182	275.	1		2120	257	0.
1		0240	33	283.	1		0855	108	2939.	1		1510	183	244.	1		2125	258	0.
1		0245	34	305.	1		0900	109	2898.	1		1515	184	213.	1		2130	259	0.
1		0250	35	324.	1		0905	110	2859.	1		1520	185	178.	1		2135	260	0.
1		0255	36	343.	1		0910	111	2821.	1		1525	186	142.	1		2140	261	0.
1		0300	37	363.	1		0915	112	2784.	1		1530	187	110.	1		2145	262	0.
1		0305	38	392.	1		0920	113	2748.	1		1535	188	84.	1		2150	263	0.
1		0310	39	432.	1		0925	114	2714.	1		1540	189	64.	1		2155	264	0.
1		0315	40	493.	1		0930	115	2680.	1		1545	190	48.	1		2200	265	0.
1		0320	41	589.	1		0935	116	2647.	1		1550	191	37.	1		2205	266	0.
1		0325	42	725.	1		0940	117	2613.	1		1555	192	28.	1		2210	267	0.
1		0330	43	928.	1		0945	118	2579.	1		1600	193	21.	1		2215	268	0.
1		0335	44	1222.	1		0950	119	2545.	1		1605	194	16.	1		2220	269	0.
1		0340	45	1598.	1		0955	120	2513.	1		1610	195	12.	1		2225	270	0.
1		0345	46	2040.	1		1000	121	2481.	1		1615	196	9.	1		2230	271	0.
1		0350	47	2526.	1		1005	122	2450.	1		1620	197	7.	1		2235	272	0.
1		0355	48	3037.	1		1010	123	2419.	1		1625	198	5.	1		2240	273	0.
1		0400	49	3538.	1		1015	124	2387.	1		1630	199	4.	1		2245	274	0.
1		0405	50	3983.	1		1020	125	2355.	1		1635	200	3.	1		2250	275	0.
1		0410	51	4348.	1		1025	126	2322.	1		1640	201	2.	1		2255	276	0.
1		0415	52	4626.	1		1030	127	2290.	1		1645	202	2.	1		2300	277	0.
1		0420	53	4833.	1		1035	128	2259.	1		1650	203	1.	1		2305	278	0.
1		0425	54	4982.	1		1040	129	2228.	1		1655	204	1.	1		2310	279	0.

1	0430	55	5096.	*	1	1045	130	2197.	*	1	1700	205	1.	*	1	2315	280	0.
1	0435	56	5212.	*	1	1050	131	2165.	*	1	1705	206	1.	*	1	2320	281	0.
1	0440	57	5340.	*	1	1055	132	2132.	*	1	1710	207	0.	*	1	2325	282	0.
1	0445	58	5461.	*	1	1100	133	2098.	*	1	1715	208	0.	*	1	2330	283	0.
1	0450	59	5581.	*	1	1105	134	2064.	*	1	1720	209	0.	*	1	2335	284	0.
1	0455	60	5727.	*	1	1110	135	2031.	*	1	1725	210	0.	*	1	2340	285	0.
1	0500	61	5902.	*	1	1115	136	1998.	*	1	1730	211	0.	*	1	2345	286	0.
1	0505	62	6084.	*	1	1120	137	1965.	*	1	1735	212	0.	*	1	2350	287	0.
1	0510	63	6261.	*	1	1125	138	1930.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	6418.	*	1	1130	139	1894.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	6539.	*	1	1135	140	1857.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	6605.	*	1	1140	141	1821.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	6619.	*	1	1145	142	1784.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	6589.	*	1	1150	143	1749.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	6520.	*	1	1155	144	1712.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	6418.	*	1	1200	145	1675.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	6293.	*	1	1205	146	1636.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	6155.	*	1	1210	147	1598.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	6010.	*	1	1215	148	1561.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	5862.	*	1	1220	149	1524.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	5717.	*	1	1225	150	1486.	*	1	1840	225	0.	*	2	0055	300	0.

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PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
+ 6619.	5.50	(CFS)	4414.	1469.	1415.	1415.
		(INCHES)	.462	.615	.615	.615
		(AC-FT)	2189.	2913.	2913.	2913.

CUMULATIVE AREA = 88.86 SQ MI

COMPUTED MUSKINGUM-CUNGE PARAMETERS
COMPUTATION TIME STEP

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	.08	1.64	3.61	750.00	4186.98	335.27	.35	6.93

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

MAIN	.08	1.64	5.00		4186.51	335.00	.35

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1647E+04 EXCESS= .0000E+00 OUTFLOW= .1647E+04 BASIN STORAGE= .1210E-01 PERCENT ERROR= .0

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HYDROGRAPH AT STATION FINISH
PLAN 1, RATIO = .57

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DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	*	1		0615	76	3721.	*	1		1230	151	352.	*	1		1845	226	0.
1		0005	2	0.	*	1		0620	77	3657.	*	1		1235	152	320.	*	1		1850	227	0.
1		0010	3	0.	*	1		0625	78	3595.	*	1		1240	153	290.	*	1		1855	228	0.
1		0015	4	0.	*	1		0630	79	3532.	*	1		1245	154	263.	*	1		1900	229	0.
1		0020	5	0.	*	1		0635	80	3469.	*	1		1250	155	236.	*	1		1905	230	0.
1		0025	6	0.	*	1		0640	81	3404.	*	1		1255	156	208.	*	1		1910	231	0.
1		0030	7	0.	*	1		0645	82	3337.	*	1		1300	157	176.	*	1		1915	232	0.
1		0035	8	0.	*	1		0650	83	3270.	*	1		1305	158	143.	*	1		1920	233	0.
1		0040	9	0.	*	1		0655	84	3203.	*	1		1310	159	114.	*	1		1925	234	0.
1		0045	10	0.	*	1		0700	85	3138.	*	1		1315	160	90.	*	1		1930	235	0.
1		0050	11	0.	*	1		0705	86	3074.	*	1		1320	161	71.	*	1		1935	236	0.
1		0055	12	0.	*	1		0710	87	3011.	*	1		1325	162	57.	*	1		1940	237	0.
1		0100	13	0.	*	1		0715	88	2950.	*	1		1330	163	46.	*	1		1945	238	0.
1		0105	14	0.	*	1		0720	89	2891.	*	1		1335	164	37.	*	1		1950	239	0.
1		0110	15	0.	*	1		0725	90	2833.	*	1		1340	165	30.	*	1		1955	240	0.
1		0115	16	0.	*	1		0730	91	2776.	*	1		1345	166	25.	*	1		2000	241	0.
1		0120	17	0.	*	1		0735	92	2718.	*	1		1350	167	21.	*	1		2005	242	0.
1		0125	18	0.	*	1		0740	93	2661.	*	1		1355	168	17.	*	1		2010	243	0.
1		0130	19	0.	*	1		0745	94	2606.	*	1		1400	169	15.	*	1		2015	244	0.

1	0135	20	0.	*	1	0750	95	2551.	*	1	1405	170	13.	*	1	2020	245	0.
1	0140	21	0.	*	1	0755	96	2499.	*	1	1410	171	11.	*	1	2025	246	0.
1	0145	22	1.	*	1	0800	97	2448.	*	1	1415	172	9.	*	1	2030	247	0.
1	0150	23	1.	*	1	0805	98	2399.	*	1	1420	173	8.	*	1	2035	248	0.
1	0155	24	3.	*	1	0810	99	2353.	*	1	1425	174	7.	*	1	2040	249	0.
1	0200	25	5.	*	1	0815	100	2308.	*	1	1430	175	6.	*	1	2045	250	0.
1	0205	26	8.	*	1	0820	101	2265.	*	1	1435	176	5.	*	1	2050	251	0.
1	0210	27	13.	*	1	0825	102	2222.	*	1	1440	177	5.	*	1	2055	252	0.
1	0215	28	19.	*	1	0830	103	2180.	*	1	1445	178	4.	*	1	2100	253	0.
1	0220	29	27.	*	1	0835	104	2137.	*	1	1450	179	4.	*	1	2105	254	0.
1	0225	30	36.	*	1	0840	105	2094.	*	1	1455	180	3.	*	1	2110	255	0.
1	0230	31	47.	*	1	0845	106	2052.	*	1	1500	181	3.	*	1	2115	256	0.
1	0235	32	57.	*	1	0850	107	2010.	*	1	1505	182	3.	*	1	2120	257	0.
1	0240	33	68.	*	1	0855	108	1969.	*	1	1510	183	2.	*	1	2125	258	0.
1	0245	34	79.	*	1	0900	109	1930.	*	1	1515	184	2.	*	1	2130	259	0.
1	0250	35	88.	*	1	0905	110	1891.	*	1	1520	185	2.	*	1	2135	260	0.
1	0255	36	97.	*	1	0910	111	1852.	*	1	1525	186	2.	*	1	2140	261	0.
1	0300	37	107.	*	1	0915	112	1812.	*	1	1530	187	2.	*	1	2145	262	0.
1	0305	38	120.	*	1	0920	113	1772.	*	1	1535	188	1.	*	1	2150	263	0.
1	0310	39	137.	*	1	0925	114	1733.	*	1	1540	189	1.	*	1	2155	264	0.
1	0315	40	162.	*	1	0930	115	1693.	*	1	1545	190	1.	*	1	2200	265	0.
1	0320	41	200.	*	1	0935	116	1655.	*	1	1550	191	1.	*	1	2205	266	0.
1	0325	42	256.	*	1	0940	117	1618.	*	1	1555	192	1.	*	1	2210	267	0.
1	0330	43	343.	*	1	0945	118	1580.	*	1	1600	193	1.	*	1	2215	268	0.
1	0335	44	479.	*	1	0950	119	1542.	*	1	1605	194	1.	*	1	2220	269	0.
1	0340	45	664.	*	1	0955	120	1503.	*	1	1610	195	1.	*	1	2225	270	0.
1	0345	46	898.	*	1	1000	121	1463.	*	1	1615	196	1.	*	1	2230	271	0.
1	0350	47	1178.	*	1	1005	122	1424.	*	1	1620	197	1.	*	1	2235	272	0.
1	0355	48	1475.	*	1	1010	123	1386.	*	1	1625	198	0.	*	1	2240	273	0.
1	0400	49	1771.	*	1	1015	124	1349.	*	1	1630	199	0.	*	1	2245	274	0.
1	0405	50	2040.	*	1	1020	125	1311.	*	1	1635	200	0.	*	1	2250	275	0.
1	0410	51	2269.	*	1	1025	126	1273.	*	1	1640	201	0.	*	1	2255	276	0.
1	0415	52	2457.	*	1	1030	127	1234.	*	1	1645	202	0.	*	1	2300	277	0.
1	0420	53	2611.	*	1	1035	128	1194.	*	1	1650	203	0.	*	1	2305	278	0.
1	0425	54	2724.	*	1	1040	129	1155.	*	1	1655	204	0.	*	1	2310	279	0.
1	0430	55	2806.	*	1	1045	130	1117.	*	1	1700	205	0.	*	1	2315	280	0.
1	0435	56	2857.	*	1	1050	131	1080.	*	1	1705	206	0.	*	1	2320	281	0.
1	0440	57	2887.	*	1	1055	132	1043.	*	1	1710	207	0.	*	1	2325	282	0.
1	0445	58	2925.	*	1	1100	133	1006.	*	1	1715	208	0.	*	1	2330	283	0.
1	0450	59	3011.	*	1	1105	134	967.	*	1	1720	209	0.	*	1	2335	284	0.
1	0455	60	3166.	*	1	1110	135	928.	*	1	1725	210	0.	*	1	2340	285	0.
1	0500	61	3363.	*	1	1115	136	890.	*	1	1730	211	0.	*	1	2345	286	0.
1	0505	62	3565.	*	1	1120	137	853.	*	1	1735	212	0.	*	1	2350	287	0.
1	0510	63	3749.	*	1	1125	138	818.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	3909.	*	1	1130	139	783.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	4034.	*	1	1135	140	746.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	4123.	*	1	1140	141	709.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	4171.	*	1	1145	142	670.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	4187.	*	1	1150	143	633.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	4171.	*	1	1155	144	597.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	4130.	*	1	1200	145	564.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	4075.	*	1	1205	146	531.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	4008.	*	1	1210	147	498.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	3937.	*	1	1215	148	463.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	3863.	*	1	1220	149	425.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	3790.	*	1	1225	150	387.	*	1	1840	225	0.	*	2	0055	300	0.
				*					*					*				

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PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)				
		(CFS)			
+ 4187.	5.58	2812.	831.	800.	800.
		(INCHES) .294	.348	.348	.348
		(AC-FT) 1395.	1647.	1647.	1647.

CUMULATIVE AREA = 88.86 SQ MI

COMPUTED MUSKINGUM-CUNGE PARAMETERS

ELEMENT	ALPHA	M	COMPUTATION TIME STEP DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	.08	1.64	4.51	750.00	2354.68	342.66	.18	5.54

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

MAIN .08 1.64 5.00 2351.49 345.00 .18

CONTINUITY SUMMARY (AC-FT) - INFLOW= .8597E+03 EXCESS= .0000E+00 OUTFLOW= .8597E+03 BASIN STORAGE= .1104E-01 PERCENT ERROR= .0

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HYDROGRAPH AT STATION FINISH
PLAN 1, RATIO = .44

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DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	2182.	1		1230	151	47.	1		1845	226	0.
1		0005	2	0.	1		0620	77	2160.	1		1235	152	43.	1		1850	227	0.
1		0010	3	0.	1		0625	78	2137.	1		1240	153	40.	1		1855	228	0.
1		0015	4	0.	1		0630	79	2112.	1		1245	154	37.	1		1900	229	0.
1		0020	5	0.	1		0635	80	2084.	1		1250	155	35.	1		1905	230	0.
1		0025	6	0.	1		0640	81	2054.	1		1255	156	32.	1		1910	231	0.
1		0030	7	0.	1		0645	82	2022.	1		1300	157	30.	1		1915	232	0.
1		0035	8	0.	1		0650	83	1989.	1		1305	158	28.	1		1920	233	0.
1		0040	9	0.	1		0655	84	1955.	1		1310	159	27.	1		1925	234	0.
1		0045	10	0.	1		0700	85	1921.	1		1315	160	25.	1		1930	235	0.
1		0050	11	0.	1		0705	86	1885.	1		1320	161	23.	1		1935	236	0.
1		0055	12	0.	1		0710	87	1850.	1		1325	162	22.	1		1940	237	0.
1		0100	13	0.	1		0715	88	1814.	1		1330	163	20.	1		1945	238	0.
1		0105	14	0.	1		0720	89	1778.	1		1335	164	19.	1		1950	239	0.
1		0110	15	0.	1		0725	90	1743.	1		1340	165	18.	1		1955	240	0.
1		0115	16	0.	1		0730	91	1707.	1		1345	166	17.	1		2000	241	0.
1		0120	17	0.	1		0735	92	1670.	1		1350	167	15.	1		2005	242	0.
1		0125	18	0.	1		0740	93	1633.	1		1355	168	14.	1		2010	243	0.
1		0130	19	0.	1		0745	94	1597.	1		1400	169	13.	1		2015	244	0.
1		0135	20	0.	1		0750	95	1560.	1		1405	170	12.	1		2020	245	0.
1		0140	21	0.	1		0755	96	1524.	1		1410	171	12.	1		2025	246	0.
1		0145	22	0.	1		0800	97	1488.	1		1415	172	11.	1		2030	247	0.
1		0150	23	0.	1		0805	98	1452.	1		1420	173	10.	1		2035	248	0.
1		0155	24	0.	1		0810	99	1415.	1		1425	174	9.	1		2040	249	0.
1		0200	25	0.	1		0815	100	1379.	1		1430	175	8.	1		2045	250	0.
1		0205	26	0.	1		0820	101	1343.	1		1435	176	8.	1		2050	251	0.
1		0210	27	0.	1		0825	102	1307.	1		1440	177	7.	1		2055	252	0.
1		0215	28	0.	1		0830	103	1273.	1		1445	178	7.	1		2100	253	0.
1		0220	29	0.	1		0835	104	1239.	1		1450	179	6.	1		2105	254	0.
1		0225	30	1.	1		0840	105	1206.	1		1455	180	6.	1		2110	255	0.
1		0230	31	2.	1		0845	106	1173.	1		1500	181	5.	1		2115	256	0.
1		0235	32	3.	1		0850	107	1141.	1		1505	182	5.	1		2120	257	0.
1		0240	33	4.	1		0855	108	1109.	1		1510	183	5.	1		2125	258	0.
1		0245	34	5.	1		0900	109	1076.	1		1515	184	4.	1		2130	259	0.
1		0250	35	7.	1		0905	110	1042.	1		1520	185	4.	1		2135	260	0.
1		0255	36	9.	1		0910	111	1007.	1		1525	186	4.	1		2140	261	0.
1		0300	37	12.	1		0915	112	972.	1		1530	187	3.	1		2145	262	0.
1		0305	38	15.	1		0920	113	940.	1		1535	188	3.	1		2150	263	0.
1		0310	39	20.	1		0925	114	909.	1		1540	189	3.	1		2155	264	0.
1		0315	40	28.	1		0930	115	878.	1		1545	190	3.	1		2200	265	0.
1		0320	41	41.	1		0935	116	848.	1		1550	191	3.	1		2205	266	0.
1		0325	42	61.	1		0940	117	818.	1		1555	192	2.	1		2210	267	0.
1		0330	43	92.	1		0945	118	788.	1		1600	193	2.	1		2215	268	0.
1		0335	44	139.	1		0950	119	756.	1		1605	194	2.	1		2220	269	0.
1		0340	45	216.	1		0955	120	722.	1		1610	195	2.	1		2225	270	0.
1		0345	46	327.	1		1000	121	688.	1		1615	196	2.	1		2230	271	0.
1		0350	47	463.	1		1005	122	656.	1		1620	197	2.	1		2235	272	0.
1		0355	48	623.	1		1010	123	626.	1		1625	198	2.	1		2240	273	0.
1		0400	49	794.	1		1015	124	596.	1		1630	199	1.	1		2245	274	0.
1		0405	50	953.	1		1020	125	568.	1		1635	200	1.	1		2250	275	0.
1		0410	51	1084.	1		1025	126	541.	1		1640	201	1.	1		2255	276	0.
1		0415	52	1190.	1		1030	127	513.	1		1645	202	1.	1		2300	277	0.
1		0420	53	1272.	1		1035	128	483.	1		1650	203	1.	1		2305	278	0.
1		0425	54	1336.	1		1040	129	450.	1		1655	204	1.	1		2310	279	0.
1		0430	55	1386.	1		1045	130	415.	1		1700	205	1.	1		2315	280	0.
1		0435	56	1426.	1		1050	131	382.	1		1705	206	1.	1		2320	281	0.
1		0440	57	1462.	1		1055	132	353.	1		1710	207	1.	1		2325	282	0.
1		0445	58	1489.	1		1100	133	327.	1		1715	208	1.	1		2330	283	0.
1		0450	59	1509.	1		1105	134	303.	1		1720	209	1.	1		2335	284	0.
1		0455	60	1541.	1		1110	135	280.	1		1725	210	1.	1		2340	285	0.
1		0500	61	1593.	1		1115	136	260.	1		1730	211	1.	1		2345	286	0.
1		0505	62	1660.	1		1120	137	240.	1		1735	212	1.	1		2350	287	0.
1		0510	63	1749.	1		1125	138	221.	1		1740	213	0.	1		2355	288	0.
1		0515	64	1875.	1		1130	139	201.	1		1745	214	0.	2		0000	289	0.
1		0520	65	2043.	1		1135	140	179.	1		1750	215	0.	2		0005	290	0.

1	0525	66	2198.	*	1	1140	141	156.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	2281.	*	1	1145	142	135.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	2322.	*	1	1150	143	116.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	2348.	*	1	1155	144	100.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	2351.	*	1	1200	145	87.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	2337.	*	1	1205	146	77.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	2310.	*	1	1210	147	68.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	2276.	*	1	1215	148	61.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	2241.	*	1	1220	149	56.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	2209.	*	1	1225	150	51.	*	1	1840	225	0.	*	2	0055	300	0.
				*					*					*				

****

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 2351.	5.75		1567.	433.	418.	418.
		(INCHES)	.164	.181	.181	.181
		(AC-FT)	777.	860.	860.	860.

CUMULATIVE AREA = 88.86 SQ MI

COMPUTED MUSKINGUM-CUNGE PARAMETERS

ELEMENT	ALPHA	M	COMPUTATION TIME STEP DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	.08	1.64	5.00	500.00	400.53	445.00	.03	2.78

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

MAIN	.08	1.64	5.00		400.53	445.00	.03

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1547E+03 EXCESS= .0000E+00 OUTFLOW= .1548E+03 BASIN STORAGE= .1129E-01 PERCENT ERROR= .0

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HYDROGRAPH AT STATION FINISH
PLAN 1, RATIO = .26

****

DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	*	1		0615	76	303.	*	1		1230	151	35.	*	1		1845	226	1.
1		0005	2	0.	*	1		0620	77	292.	*	1		1235	152	33.	*	1		1850	227	1.
1		0010	3	0.	*	1		0625	78	283.	*	1		1240	153	32.	*	1		1855	228	1.
1		0015	4	0.	*	1		0630	79	275.	*	1		1245	154	31.	*	1		1900	229	1.
1		0020	5	0.	*	1		0635	80	267.	*	1		1250	155	29.	*	1		1905	230	1.
1		0025	6	0.	*	1		0640	81	257.	*	1		1255	156	28.	*	1		1910	231	1.
1		0030	7	0.	*	1		0645	82	248.	*	1		1300	157	27.	*	1		1915	232	1.
1		0035	8	0.	*	1		0650	83	244.	*	1		1305	158	25.	*	1		1920	233	1.
1		0040	9	0.	*	1		0655	84	260.	*	1		1310	159	24.	*	1		1925	234	1.
1		0045	10	0.	*	1		0700	85	309.	*	1		1315	160	23.	*	1		1930	235	1.
1		0050	11	0.	*	1		0705	86	362.	*	1		1320	161	22.	*	1		1935	236	1.
1		0055	12	0.	*	1		0710	87	368.	*	1		1325	162	21.	*	1		1940	237	0.
1		0100	13	0.	*	1		0715	88	358.	*	1		1330	163	20.	*	1		1945	238	0.
1		0105	14	0.	*	1		0720	89	382.	*	1		1335	164	18.	*	1		1950	239	0.
1		0110	15	0.	*	1		0725	90	401.	*	1		1340	165	18.	*	1		1955	240	0.
1		0115	16	0.	*	1		0730	91	391.	*	1		1345	166	17.	*	1		2000	241	0.
1		0120	17	0.	*	1		0735	92	394.	*	1		1350	167	16.	*	1		2005	242	0.
1		0125	18	0.	*	1		0740	93	398.	*	1		1355	168	15.	*	1		2010	243	0.
1		0130	19	0.	*	1		0745	94	385.	*	1		1400	169	14.	*	1		2015	244	0.
1		0135	20	0.	*	1		0750	95	382.	*	1		1405	170	13.	*	1		2020	245	0.
1		0140	21	0.	*	1		0755	96	377.	*	1		1410	171	13.	*	1		2025	246	0.
1		0145	22	0.	*	1		0800	97	364.	*	1		1415	172	12.	*	1		2030	247	0.
1		0150	23	0.	*	1		0805	98	358.	*	1		1420	173	11.	*	1		2035	248	0.
1		0155	24	0.	*	1		0810	99	348.	*	1		1425	174	11.	*	1		2040	249	0.
1		0200	25	0.	*	1		0815	100	336.	*	1		1430	175	10.	*	1		2045	250	0.
1		0205	26	0.	*	1		0820	101	328.	*	1		1435	176	10.	*	1		2050	251	0.
1		0210	27	0.	*	1		0825	102	316.	*	1		1440	177	9.	*	1		2055	252	0.
1		0215	28	0.	*	1		0830	103	306.	*	1		1445	178	9.	*	1		2100	253	0.
1		0220	29	0.	*	1		0835	104	296.	*	1		1450	179	8.	*	1		2105	254	0.
1		0225	30	0.	*	1		0840	105	285.	*	1		1455	180	8.	*	1		2110	255	0.

1	0230	31	0.	*	1	0845	106	276.	*	1	1500	181	7.	*	1	2115	256	0.
1	0235	32	0.	*	1	0850	107	265.	*	1	1505	182	7.	*	1	2120	257	0.
1	0240	33	0.	*	1	0855	108	255.	*	1	1510	183	7.	*	1	2125	258	0.
1	0245	34	0.	*	1	0900	109	245.	*	1	1515	184	6.	*	1	2130	259	0.
1	0250	35	0.	*	1	0905	110	235.	*	1	1520	185	6.	*	1	2135	260	0.
1	0255	36	0.	*	1	0910	111	225.	*	1	1525	186	6.	*	1	2140	261	0.
1	0300	37	0.	*	1	0915	112	214.	*	1	1530	187	6.	*	1	2145	262	0.
1	0305	38	0.	*	1	0920	113	202.	*	1	1535	188	5.	*	1	2150	263	0.
1	0310	39	0.	*	1	0925	114	189.	*	1	1540	189	5.	*	1	2155	264	0.
1	0315	40	0.	*	1	0930	115	175.	*	1	1545	190	5.	*	1	2200	265	0.
1	0320	41	0.	*	1	0935	116	161.	*	1	1550	191	5.	*	1	2205	266	0.
1	0325	42	0.	*	1	0940	117	151.	*	1	1555	192	4.	*	1	2210	267	0.
1	0330	43	0.	*	1	0945	118	143.	*	1	1600	193	4.	*	1	2215	268	0.
1	0335	44	0.	*	1	0950	119	135.	*	1	1605	194	4.	*	1	2220	269	0.
1	0340	45	2.	*	1	0955	120	127.	*	1	1610	195	4.	*	1	2225	270	0.
1	0345	46	5.	*	1	1000	121	120.	*	1	1615	196	4.	*	1	2230	271	0.
1	0350	47	12.	*	1	1005	122	114.	*	1	1620	197	4.	*	1	2235	272	0.
1	0355	48	23.	*	1	1010	123	108.	*	1	1625	198	3.	*	1	2240	273	0.
1	0400	49	38.	*	1	1015	124	104.	*	1	1630	199	3.	*	1	2245	274	0.
1	0405	50	61.	*	1	1020	125	100.	*	1	1635	200	3.	*	1	2250	275	0.
1	0410	51	92.	*	1	1025	126	96.	*	1	1640	201	3.	*	1	2255	276	0.
1	0415	52	119.	*	1	1030	127	93.	*	1	1645	202	3.	*	1	2300	277	0.
1	0420	53	145.	*	1	1035	128	89.	*	1	1650	203	3.	*	1	2305	278	0.
1	0425	54	170.	*	1	1040	129	86.	*	1	1655	204	3.	*	1	2310	279	0.
1	0430	55	192.	*	1	1045	130	82.	*	1	1700	205	2.	*	1	2315	280	0.
1	0435	56	205.	*	1	1050	131	79.	*	1	1705	206	2.	*	1	2320	281	0.
1	0440	57	213.	*	1	1055	132	76.	*	1	1710	207	2.	*	1	2325	282	0.
1	0445	58	219.	*	1	1100	133	73.	*	1	1715	208	2.	*	1	2330	283	0.
1	0450	59	222.	*	1	1105	134	70.	*	1	1720	209	2.	*	1	2335	284	0.
1	0455	60	225.	*	1	1110	135	67.	*	1	1725	210	2.	*	1	2340	285	0.
1	0500	61	231.	*	1	1115	136	64.	*	1	1730	211	2.	*	1	2345	286	0.
1	0505	62	241.	*	1	1120	137	61.	*	1	1735	212	2.	*	1	2350	287	0.
1	0510	63	258.	*	1	1125	138	58.	*	1	1740	213	2.	*	1	2355	288	0.
1	0515	64	281.	*	1	1130	139	56.	*	1	1745	214	2.	*	2	0000	289	0.
1	0520	65	309.	*	1	1135	140	54.	*	1	1750	215	1.	*	2	0005	290	0.
1	0525	66	337.	*	1	1140	141	52.	*	1	1755	216	1.	*	2	0010	291	0.
1	0530	67	358.	*	1	1145	142	50.	*	1	1800	217	1.	*	2	0015	292	0.
1	0535	68	370.	*	1	1150	143	48.	*	1	1805	218	1.	*	2	0020	293	0.
1	0540	69	374.	*	1	1155	144	46.	*	1	1810	219	1.	*	2	0025	294	0.
1	0545	70	373.	*	1	1200	145	45.	*	1	1815	220	1.	*	2	0030	295	0.
1	0550	71	370.	*	1	1205	146	43.	*	1	1820	221	1.	*	2	0035	296	0.
1	0555	72	360.	*	1	1210	147	41.	*	1	1825	222	1.	*	2	0040	297	0.
1	0600	73	345.	*	1	1215	148	40.	*	1	1830	223	1.	*	2	0045	298	0.
1	0605	74	330.	*	1	1220	149	38.	*	1	1835	224	1.	*	2	0050	299	0.
1	0610	75	317.	*	1	1225	150	36.	*	1	1840	225	1.	*	2	0055	300	0.
				*					*					*				

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 401.	7.42		275.	78.	75.	75.
		(INCHES)	.029	.033	.033	.033
		(AC-FT)	136.	155.	155.	155.

CUMULATIVE AREA = 88.86 SQ MI

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1****************************************                                                    ****************************************
 *                                      *                                                    *                                      *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *                                                    *    U.S. ARMY CORPS OF ENGINEERS      *
 *               JUN   1998             *                                                    *    HYDROLOGIC ENGINEERING CENTER     *
 *            VERSION 4.1               *                                                    *          609 SECOND STREET           *
 *                                      *                                                    *       DAVIS, CALIFORNIA 95616        *
 *  RUN DATE   18MAR08  TIME  14:56:20  *                                                    *           (916) 756-1104             *
 *                                      *                                                    *                                      *
 ****************************************                                                    ****************************************
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```
X     X  XXXXXXX   XXXXX           X
X     X  X        X     X         XX
X     X  X        X                X
XXXXXXX  XXXX     X        XXXXX   X
X     X  X        X                X
X     X  X        X     X          X
X     X  XXXXXXX   XXXXX          XXX
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THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM


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          LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 *** FREE ***
 *** NOLIST ***
1****************************************                                                    ****************************************
 *                                      *                                                    *                                      *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *                                                    *    U.S. ARMY CORPS OF ENGINEERS      *
 *               JUN   1998             *                                                    *    HYDROLOGIC ENGINEERING CENTER     *
 *            VERSION 4.1               *                                                    *          609 SECOND STREET           *
 *                                      *                                                    *       DAVIS, CALIFORNIA 95616        *
 *  RUN DATE   18MAR08  TIME  14:56:20  *                                                    *           (916) 756-1104             *
 *                                      *                                                    *                                      *
 ****************************************                                                    ****************************************
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KLEINFELDER
FEBRUARY 2008
ALTERNATIVE E

DESIGN STORM = 100-YEAR 6-HOUR STORM
STORM DISTRIBUTION = SDN5

```
  10 IO          OUTPUT CONTROL VARIABLES
                       IPRNT          5  PRINT CONTROL
                       IPLOT          0  PLOT CONTROL
                       QSCAL         0.  HYDROGRAPH PLOT SCALE

     IT          HYDROGRAPH TIME DATA
                        NMIN          5  MINUTES IN COMPUTATION INTERVAL
                       IDATE      1    0  STARTING DATE
                       ITIME        0000  STARTING TIME
                          NQ         300  NUMBER OF HYDROGRAPH ORDINATES
                      NDDATE      2    0  ENDING DATE
                      NDTIME        0055  ENDING TIME
                      ICENT          19  CENTURY MARK

                  COMPUTATION INTERVAL     .08 HOURS
                       TOTAL TIME BASE   24.92 HOURS

          ENGLISH UNITS
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              DRAINAGE AREA         SQUARE MILES
              PRECIPITATION DEPTH   INCHES
              LENGTH, ELEVATION     FEET
              FLOW                  CUBIC FEET PER SECOND
              STORAGE VOLUME        ACRE-FEET
              SURFACE AREA          ACRES
              TEMPERATURE           DEGREES FAHRENHEIT

     JP          MULTI-PLAN OPTION
                       NPLAN           1  NUMBER OF PLANS

     JR          MULTI-RATIO OPTION
                     RATIOS OF PRECIPITATION
                    1.00       .87       .74       .57       .44       .26


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


            **************
            *            *
1250 KK     *     ULWIN  *
            *            *
            **************

1254 KO          OUTPUT CONTROL VARIABLES
                       IPRNT           1  PRINT CONTROL
                       IPLOT           0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE

1253 HC          HYDROGRAPH COMBINATION
                       ICOMP           4  NUMBER OF HYDROGRAPHS TO COMBINE

                                                                  ***
*****************************************************************************************************************************************

                                                HYDROGRAPH AT STATION    ULWIN
                                                     SUM OF  4 HYDROGRAPHS
                                                   PLAN 1,   RATIO =  1.00
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DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	7801.	1		1230	151	3.	1		1845	226	0.
1		0005	2	0.	1		0620	77	7104.	1		1235	152	3.	1		1850	227	0.
1		0010	3	0.	1		0625	78	6480.	1		1240	153	3.	1		1855	228	0.
1		0015	4	0.	1		0630	79	5917.	1		1245	154	2.	1		1900	229	0.
1		0020	5	0.	1		0635	80	5417.	1		1250	155	2.	1		1905	230	0.
1		0025	6	1.	1		0640	81	4964.	1		1255	156	2.	1		1910	231	0.
1		0030	7	2.	1		0645	82	4554.	1		1300	157	1.	1		1915	232	0.
1		0035	8	3.	1		0650	83	4183.	1		1305	158	1.	1		1920	233	0.
1		0040	9	5.	1		0655	84	3838.	1		1310	159	1.	1		1925	234	0.
1		0045	10	8.	1		0700	85	3522.	1		1315	160	1.	1		1930	235	0.
1		0050	11	10.	1		0705	86	3229.	1		1320	161	1.	1		1935	236	0.
1		0055	12	13.	1		0710	87	2958.	1		1325	162	1.	1		1940	237	0.
1		0100	13	16.	1		0715	88	2706.	1		1330	163	1.	1		1945	238	0.
1		0105	14	19.	1		0720	89	2472.	1		1335	164	0.	1		1950	239	0.
1		0110	15	23.	1		0725	90	2257.	1		1340	165	0.	1		1955	240	0.
1		0115	16	27.	1		0730	91	2058.	1		1345	166	0.	1		2000	241	0.
1		0120	17	31.	1		0735	92	1876.	1		1350	167	0.	1		2005	242	0.
1		0125	18	37.	1		0740	93	1710.	1		1355	168	0.	1		2010	243	0.
1		0130	19	45.	1		0745	94	1558.	1		1400	169	0.	1		2015	244	0.
1		0135	20	55.	1		0750	95	1419.	1		1405	170	0.	1		2020	245	0.
1		0140	21	69.	1		0755	96	1293.	1		1410	171	0.	1		2025	246	0.
1		0145	22	87.	1		0800	97	1180.	1		1415	172	0.	1		2030	247	0.
1		0150	23	111.	1		0805	98	1077.	1		1420	173	0.	1		2035	248	0.
1		0155	24	141.	1		0810	99	981.	1		1425	174	0.	1		2040	249	0.
1		0200	25	177.	1		0815	100	891.	1		1430	175	0.	1		2045	250	0.
1		0205	26	219.	1		0820	101	809.	1		1435	176	0.	1		2050	251	0.
1		0210	27	267.	1		0825	102	733.	1		1440	177	0.	1		2055	252	0.
1		0215	28	320.	1		0830	103	663.	1		1445	178	0.	1		2100	253	0.
1		0220	29	375.	1		0835	104	600.	1		1450	179	0.	1		2105	254	0.
1		0225	30	432.	1		0840	105	544.	1		1455	180	0.	1		2110	255	0.
1		0230	31	491.	1		0845	106	493.	1		1500	181	0.	1		2115	256	0.
1		0235	32	557.	1		0850	107	447.	1		1505	182	0.	1		2120	257	0.
1		0240	33	632.	1		0855	108	406.	1		1510	183	0.	1		2125	258	0.
1		0245	34	720.	1		0900	109	369.	1		1515	184	0.	1		2130	259	0.
1		0250	35	820.	1		0905	110	335.	1		1520	185	0.	1		2135	260	0.

1	0255	36	931.	*	1	0910	111	305.	*	1	1525	186	0.	*	1	2140	261	0.
1	0300	37	1053.	*	1	0915	112	277.	*	1	1530	187	0.	*	1	2145	262	0.
1	0305	38	1185.	*	1	0920	113	252.	*	1	1535	188	0.	*	1	2150	263	0.
1	0310	39	1326.	*	1	0925	114	230.	*	1	1540	189	0.	*	1	2155	264	0.
1	0315	40	1475.	*	1	0930	115	209.	*	1	1545	190	0.	*	1	2200	265	0.
1	0320	41	1639.	*	1	0935	116	189.	*	1	1550	191	0.	*	1	2205	266	0.
1	0325	42	1836.	*	1	0940	117	171.	*	1	1555	192	0.	*	1	2210	267	0.
1	0330	43	2093.	*	1	0945	118	155.	*	1	1600	193	0.	*	1	2215	268	0.
1	0335	44	2447.	*	1	0950	119	140.	*	1	1605	194	0.	*	1	2220	269	0.
1	0340	45	2924.	*	1	0955	120	126.	*	1	1610	195	0.	*	1	2225	270	0.
1	0345	46	3540.	*	1	1000	121	114.	*	1	1615	196	0.	*	1	2230	271	0.
1	0350	47	4404.	*	1	1005	122	102.	*	1	1620	197	0.	*	1	2235	272	0.
1	0355	48	5788.	*	1	1010	123	92.	*	1	1625	198	0.	*	1	2240	273	0.
1	0400	49	7898.	*	1	1015	124	83.	*	1	1630	199	0.	*	1	2245	274	0.
1	0405	50	10616.	*	1	1020	125	74.	*	1	1635	200	0.	*	1	2250	275	0.
1	0410	51	13208.	*	1	1025	126	67.	*	1	1640	201	0.	*	1	2255	276	0.
1	0415	52	15089.	*	1	1030	127	60.	*	1	1645	202	0.	*	1	2300	277	0.
1	0420	53	16172.	*	1	1035	128	53.	*	1	1650	203	0.	*	1	2305	278	0.
1	0425	54	16720.	*	1	1040	129	48.	*	1	1655	204	0.	*	1	2310	279	0.
1	0430	55	16717.	*	1	1045	130	43.	*	1	1700	205	0.	*	1	2315	280	0.
1	0435	56	16373.	*	1	1050	131	38.	*	1	1705	206	0.	*	1	2320	281	0.
1	0440	57	15786.	*	1	1055	132	34.	*	1	1710	207	0.	*	1	2325	282	0.
1	0445	58	15050.	*	1	1100	133	30.	*	1	1715	208	0.	*	1	2330	283	0.
1	0450	59	14295.	*	1	1105	134	27.	*	1	1720	209	0.	*	1	2335	284	0.
1	0455	60	13601.	*	1	1110	135	24.	*	1	1725	210	0.	*	1	2340	285	0.
1	0500	61	13059.	*	1	1115	136	21.	*	1	1730	211	0.	*	1	2345	286	0.
1	0505	62	12705.	*	1	1120	137	19.	*	1	1735	212	0.	*	1	2350	287	0.
1	0510	63	12543.	*	1	1125	138	17.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	12520.	*	1	1130	139	15.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	12649.	*	1	1135	140	14.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	12842.	*	1	1140	141	12.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	13000.	*	1	1145	142	11.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	13012.	*	1	1150	143	10.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	12814.	*	1	1155	144	8.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	12374.	*	1	1200	145	7.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	11762.	*	1	1205	146	7.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	11016.	*	1	1210	147	6.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	10194.	*	1	1215	148	5.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	9371.	*	1	1220	149	4.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	8562.	*	1	1225	150	4.	*	1	1840	225	0.	*	2	0055	300	0.

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)	(CFS)				
+ 16720.	4.42		6486.	1654.	1593.	1593.
		(INCHES)	1.025	1.045	1.045	1.045
		(AC-FT)	3216.	3280.	3280.	3280.

CUMULATIVE AREA = 58.84 SQ MI

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HYDROGRAPH AT STATION ULWIN
SUM OF 4 HYDROGRAPHS
PLAN 1, RATIO = .87

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DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	*	1		0615	76	6553.	*	1		1230	151	5.	*	1		1845	226	0.
1		0005	2	0.	*	1		0620	77	5987.	*	1		1235	152	5.	*	1		1850	227	0.
1		0010	3	0.	*	1		0625	78	5468.	*	1		1240	153	4.	*	1		1855	228	0.
1		0015	4	0.	*	1		0630	79	4994.	*	1		1245	154	4.	*	1		1900	229	0.
1		0020	5	0.	*	1		0635	80	4574.	*	1		1250	155	3.	*	1		1905	230	0.
1		0025	6	0.	*	1		0640	81	4202.	*	1		1255	156	3.	*	1		1910	231	0.
1		0030	7	1.	*	1		0645	82	3862.	*	1		1300	157	2.	*	1		1915	232	0.
1		0035	8	2.	*	1		0650	83	3551.	*	1		1305	158	2.	*	1		1920	233	0.
1		0040	9	3.	*	1		0655	84	3266.	*	1		1310	159	2.	*	1		1925	234	0.
1		0045	10	4.	*	1		0700	85	3004.	*	1		1315	160	2.	*	1		1930	235	0.
1		0050	11	6.	*	1		0705	86	2761.	*	1		1320	161	1.	*	1		1935	236	0.
1		0055	12	7.	*	1		0710	87	2537.	*	1		1325	162	1.	*	1		1940	237	0.
1		0100	13	8.	*	1		0715	88	2331.	*	1		1330	163	1.	*	1		1945	238	0.
1		0105	14	9.	*	1		0720	89	2139.	*	1		1335	164	1.	*	1		1950	239	0.
1		0110	15	10.	*	1		0725	90	1961.	*	1		1340	165	1.	*	1		1955	240	0.
1		0115	16	11.	*	1		0730	91	1798.	*	1		1345	166	1.	*	1		2000	241	0.
1		0120	17	12.	*	1		0735	92	1647.	*	1		1350	167	1.	*	1		2005	242	0.

1	0125	18	14.	*	1	0740	93	1508.	*	1	1355	168	1.	*	1	2010	243	0.
1	0130	19	17.	*	1	0745	94	1382.	*	1	1400	169	0.	*	1	2015	244	0.
1	0135	20	20.	*	1	0750	95	1267.	*	1	1405	170	0.	*	1	2020	245	0.
1	0140	21	25.	*	1	0755	96	1162.	*	1	1410	171	0.	*	1	2025	246	0.
1	0145	22	32.	*	1	0800	97	1066.	*	1	1415	172	0.	*	1	2030	247	0.
1	0150	23	41.	*	1	0805	98	979.	*	1	1420	173	0.	*	1	2035	248	0.
1	0155	24	51.	*	1	0810	99	897.	*	1	1425	174	0.	*	1	2040	249	0.
1	0200	25	65.	*	1	0815	100	822.	*	1	1430	175	0.	*	1	2045	250	0.
1	0205	26	83.	*	1	0820	101	753.	*	1	1435	176	0.	*	1	2050	251	0.
1	0210	27	104.	*	1	0825	102	689.	*	1	1440	177	0.	*	1	2055	252	0.
1	0215	28	129.	*	1	0830	103	629.	*	1	1445	178	0.	*	1	2100	253	0.
1	0220	29	157.	*	1	0835	104	572.	*	1	1450	179	0.	*	1	2105	254	0.
1	0225	30	188.	*	1	0840	105	520.	*	1	1455	180	0.	*	1	2110	255	0.
1	0230	31	220.	*	1	0845	106	472.	*	1	1500	181	0.	*	1	2115	256	0.
1	0235	32	254.	*	1	0850	107	429.	*	1	1505	182	0.	*	1	2120	257	0.
1	0240	33	291.	*	1	0855	108	390.	*	1	1510	183	0.	*	1	2125	258	0.
1	0245	34	334.	*	1	0900	109	355.	*	1	1515	184	0.	*	1	2130	259	0.
1	0250	35	384.	*	1	0905	110	323.	*	1	1520	185	0.	*	1	2135	260	0.
1	0255	36	442.	*	1	0910	111	294.	*	1	1525	186	0.	*	1	2140	261	0.
1	0300	37	512.	*	1	0915	112	268.	*	1	1530	187	0.	*	1	2145	262	0.
1	0305	38	598.	*	1	0920	113	244.	*	1	1535	188	0.	*	1	2150	263	0.
1	0310	39	702.	*	1	0925	114	223.	*	1	1540	189	0.	*	1	2155	264	0.
1	0315	40	824.	*	1	0930	115	204.	*	1	1545	190	0.	*	1	2200	265	0.
1	0320	41	960.	*	1	0935	116	187.	*	1	1550	191	0.	*	1	2205	266	0.
1	0325	42	1116.	*	1	0940	117	171.	*	1	1555	192	0.	*	1	2210	267	0.
1	0330	43	1309.	*	1	0945	118	157.	*	1	1600	193	0.	*	1	2215	268	0.
1	0335	44	1564.	*	1	0950	119	143.	*	1	1605	194	0.	*	1	2220	269	0.
1	0340	45	1900.	*	1	0955	120	131.	*	1	1610	195	0.	*	1	2225	270	0.
1	0345	46	2307.	*	1	1000	121	120.	*	1	1615	196	0.	*	1	2230	271	0.
1	0350	47	2783.	*	1	1005	122	110.	*	1	1620	197	0.	*	1	2235	272	0.
1	0355	48	3397.	*	1	1010	123	101.	*	1	1625	198	0.	*	1	2240	273	0.
1	0400	49	4450.	*	1	1015	124	92.	*	1	1630	199	0.	*	1	2245	274	0.
1	0405	50	6352.	*	1	1020	125	84.	*	1	1635	200	0.	*	1	2250	275	0.
1	0410	51	8616.	*	1	1025	126	77.	*	1	1640	201	0.	*	1	2255	276	0.
1	0415	52	10466.	*	1	1030	127	70.	*	1	1645	202	0.	*	1	2300	277	0.
1	0420	53	11645.	*	1	1035	128	64.	*	1	1650	203	0.	*	1	2305	278	0.
1	0425	54	12205.	*	1	1040	129	58.	*	1	1655	204	0.	*	1	2310	279	0.
1	0430	55	12399.	*	1	1045	130	53.	*	1	1700	205	0.	*	1	2315	280	0.
1	0435	56	12298.	*	1	1050	131	48.	*	1	1705	206	0.	*	1	2320	281	0.
1	0440	57	12046.	*	1	1055	132	43.	*	1	1710	207	0.	*	1	2325	282	0.
1	0445	58	11685.	*	1	1100	133	39.	*	1	1715	208	0.	*	1	2330	283	0.
1	0450	59	11231.	*	1	1105	134	35.	*	1	1720	209	0.	*	1	2335	284	0.
1	0455	60	10731.	*	1	1110	135	31.	*	1	1725	210	0.	*	1	2340	285	0.
1	0500	61	10294.	*	1	1115	136	28.	*	1	1730	211	0.	*	1	2345	286	0.
1	0505	62	9968.	*	1	1120	137	25.	*	1	1735	212	0.	*	1	2350	287	0.
1	0510	63	9796.	*	1	1125	138	23.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	9769.	*	1	1130	139	20.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	9834.	*	1	1135	140	18.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	9987.	*	1	1140	141	16.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	10169.	*	1	1145	142	15.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	10271.	*	1	1150	143	13.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	10221.	*	1	1155	144	12.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	9970.	*	1	1200	145	11.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	9552.	*	1	1205	146	9.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	9033.	*	1	1210	147	8.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	8432.	*	1	1215	148	8.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	7794.	*	1	1220	149	7.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	7161.	*	1	1225	150	6.	*	1	1840	225	0.	*	2	0055	300	0.

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PEAK FLOW (CFS)	TIME (HR)	MAXIMUM AVERAGE FLOW (CFS)	6-HR	24-HR	72-HR	24.92-HR
+ 12399.	4.50		4980.	1269.	1222.	1222.
		(INCHES)	.787	.802	.802	.802
		(AC-FT)	2469.	2517.	2517.	2517.

CUMULATIVE AREA = 58.84 SQ MI

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HYDROGRAPH AT STATION ULWIN
SUM OF 4 HYDROGRAPHS
PLAN 1, RATIO = .74

****

DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW

1	0000	1	0.	*	1	0615	76	5256.	*	1	1230	151	6.	*	1	1845	226	0.
1	0005	2	0.	*	1	0620	77	4829.	*	1	1235	152	5.	*	1	1850	227	0.
1	0010	3	0.	*	1	0625	78	4425.	*	1	1240	153	5.	*	1	1855	228	0.
1	0015	4	0.	*	1	0630	79	4053.	*	1	1245	154	4.	*	1	1900	229	0.
1	0020	5	0.	*	1	0635	80	3719.	*	1	1250	155	4.	*	1	1905	230	0.
1	0025	6	0.	*	1	0640	81	3418.	*	1	1255	156	3.	*	1	1910	231	0.
1	0030	7	0.	*	1	0645	82	3147.	*	1	1300	157	3.	*	1	1915	232	0.
1	0035	8	1.	*	1	0650	83	2899.	*	1	1305	158	3.	*	1	1920	233	0.
1	0040	9	1.	*	1	0655	84	2672.	*	1	1310	159	2.	*	1	1925	234	0.
1	0045	10	2.	*	1	0700	85	2464.	*	1	1315	160	2.	*	1	1930	235	0.
1	0050	11	3.	*	1	0705	86	2274.	*	1	1320	161	2.	*	1	1935	236	0.
1	0055	12	4.	*	1	0710	87	2099.	*	1	1325	162	2.	*	1	1940	237	0.
1	0100	13	4.	*	1	0715	88	1936.	*	1	1330	163	1.	*	1	1945	238	0.
1	0105	14	5.	*	1	0720	89	1785.	*	1	1335	164	1.	*	1	1950	239	0.
1	0110	15	5.	*	1	0725	90	1644.	*	1	1340	165	1.	*	1	1955	240	0.
1	0115	16	5.	*	1	0730	91	1514.	*	1	1345	166	1.	*	1	2000	241	0.
1	0120	17	5.	*	1	0735	92	1395.	*	1	1350	167	1.	*	1	2005	242	0.
1	0125	18	6.	*	1	0740	93	1285.	*	1	1355	168	1.	*	1	2010	243	0.
1	0130	19	6.	*	1	0745	94	1183.	*	1	1400	169	1.	*	1	2015	244	0.
1	0135	20	7.	*	1	0750	95	1088.	*	1	1405	170	1.	*	1	2020	245	0.
1	0140	21	9.	*	1	0755	96	1001.	*	1	1410	171	0.	*	1	2025	246	0.
1	0145	22	11.	*	1	0800	97	919.	*	1	1415	172	0.	*	1	2030	247	0.
1	0150	23	14.	*	1	0805	98	844.	*	1	1420	173	0.	*	1	2035	248	0.
1	0155	24	18.	*	1	0810	99	774.	*	1	1425	174	0.	*	1	2040	249	0.
1	0200	25	23.	*	1	0815	100	710.	*	1	1430	175	0.	*	1	2045	250	0.
1	0205	26	29.	*	1	0820	101	652.	*	1	1435	176	0.	*	1	2050	251	0.
1	0210	27	37.	*	1	0825	102	599.	*	1	1440	177	0.	*	1	2055	252	0.
1	0215	28	46.	*	1	0830	103	551.	*	1	1445	178	0.	*	1	2100	253	0.
1	0220	29	56.	*	1	0835	104	507.	*	1	1450	179	0.	*	1	2105	254	0.
1	0225	30	68.	*	1	0840	105	465.	*	1	1455	180	0.	*	1	2110	255	0.
1	0230	31	80.	*	1	0845	106	426.	*	1	1500	181	0.	*	1	2115	256	0.
1	0235	32	94.	*	1	0850	107	389.	*	1	1505	182	0.	*	1	2120	257	0.
1	0240	33	109.	*	1	0855	108	356.	*	1	1510	183	0.	*	1	2125	258	0.
1	0245	34	125.	*	1	0900	109	325.	*	1	1515	184	0.	*	1	2130	259	0.
1	0250	35	144.	*	1	0905	110	297.	*	1	1520	185	0.	*	1	2135	260	0.
1	0255	36	167.	*	1	0910	111	271.	*	1	1525	186	0.	*	1	2140	261	0.
1	0300	37	198.	*	1	0915	112	248.	*	1	1530	187	0.	*	1	2145	262	0.
1	0305	38	237.	*	1	0920	113	227.	*	1	1535	188	0.	*	1	2150	263	0.
1	0310	39	287.	*	1	0925	114	208.	*	1	1540	189	0.	*	1	2155	264	0.
1	0315	40	350.	*	1	0930	115	191.	*	1	1545	190	0.	*	1	2200	265	0.
1	0320	41	433.	*	1	0935	116	175.	*	1	1550	191	0.	*	1	2205	266	0.
1	0325	42	539.	*	1	0940	117	160.	*	1	1555	192	0.	*	1	2210	267	0.
1	0330	43	672.	*	1	0945	118	147.	*	1	1600	193	0.	*	1	2215	268	0.
1	0335	44	835.	*	1	0950	119	135.	*	1	1605	194	0.	*	1	2220	269	0.
1	0340	45	1049.	*	1	0955	120	124.	*	1	1610	195	0.	*	1	2225	270	0.
1	0345	46	1323.	*	1	1000	121	114.	*	1	1615	196	0.	*	1	2230	271	0.
1	0350	47	1642.	*	1	1005	122	105.	*	1	1620	197	0.	*	1	2235	272	0.
1	0355	48	1977.	*	1	1010	123	97.	*	1	1625	198	0.	*	1	2240	273	0.
1	0400	49	2341.	*	1	1015	124	89.	*	1	1630	199	0.	*	1	2245	274	0.
1	0405	50	2907.	*	1	1020	125	82.	*	1	1635	200	0.	*	1	2250	275	0.
1	0410	51	4176.	*	1	1025	126	75.	*	1	1640	201	0.	*	1	2255	276	0.
1	0415	52	6120.	*	1	1030	127	69.	*	1	1645	202	0.	*	1	2300	277	0.
1	0420	53	7540.	*	1	1035	128	63.	*	1	1650	203	0.	*	1	2305	278	0.
1	0425	54	8274.	*	1	1040	129	58.	*	1	1655	204	0.	*	1	2310	279	0.
1	0430	55	8595.	*	1	1045	130	52.	*	1	1700	205	0.	*	1	2315	280	0.
1	0435	56	8612.	*	1	1050	131	48.	*	1	1705	206	0.	*	1	2320	281	0.
1	0440	57	8464.	*	1	1055	132	43.	*	1	1710	207	0.	*	1	2325	282	0.
1	0445	58	8257.	*	1	1100	133	39.	*	1	1715	208	0.	*	1	2330	283	0.
1	0450	59	8041.	*	1	1105	134	36.	*	1	1720	209	0.	*	1	2335	284	0.
1	0455	60	7823.	*	1	1110	135	32.	*	1	1725	210	0.	*	1	2340	285	0.
1	0500	61	7599.	*	1	1115	136	29.	*	1	1730	211	0.	*	1	2345	286	0.
1	0505	62	7373.	*	1	1120	137	26.	*	1	1735	212	0.	*	1	2350	287	0.
1	0510	63	7193.	*	1	1125	138	24.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	7115.	*	1	1130	139	21.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	7141.	*	1	1135	140	19.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	7244.	*	1	1140	141	17.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	7395.	*	1	1145	142	16.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	7542.	*	1	1150	143	14.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	7606.	*	1	1155	144	13.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	7533.	*	1	1200	145	12.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	7317.	*	1	1205	146	10.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	6991.	*	1	1210	147	9.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	6597.	*	1	1215	148	8.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	6161.	*	1	1220	149	8.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	5705.	*	1	1225	150	7.	*	1	1840	225	0.	*	2	0055	300	0.

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PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.92-HR

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+   (CFS)       (HR)
                          (CFS)
+    8612.      4.58                 3593.        914.        881.         881.
                         (INCHES)      .568        .578        .578         .578
                          (AC-FT)     1781.       1814.       1814.        1814.

                         CUMULATIVE AREA =   58.84 SQ MI
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HYDROGRAPH AT STATION ULWIN
SUM OF 4 HYDROGRAPHS
PLAN 1, RATIO = .57

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DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	3442.	1		1230	151	10.	1		1845	226	0.
1		0005	2	0.	1		0620	77	3216.	1		1235	152	9.	1		1850	227	0.
1		0010	3	0.	1		0625	78	2994.	1		1240	153	8.	1		1855	228	0.
1		0015	4	0.	1		0630	79	2779.	1		1245	154	8.	1		1900	229	0.
1		0020	5	0.	1		0635	80	2571.	1		1250	155	7.	1		1905	230	0.
1		0025	6	0.	1		0640	81	2373.	1		1255	156	6.	1		1910	231	0.
1		0030	7	0.	1		0645	82	2189.	1		1300	157	6.	1		1915	232	0.
1		0035	8	0.	1		0650	83	2020.	1		1305	158	5.	1		1920	233	0.
1		0040	9	0.	1		0655	84	1868.	1		1310	159	5.	1		1925	234	0.
1		0045	10	0.	1		0700	85	1729.	1		1315	160	4.	1		1930	235	0.
1		0050	11	1.	1		0705	86	1603.	1		1320	161	4.	1		1935	236	0.
1		0055	12	1.	1		0710	87	1487.	1		1325	162	4.	1		1940	237	0.
1		0100	13	1.	1		0715	88	1380.	1		1330	163	3.	1		1945	238	0.
1		0105	14	1.	1		0720	89	1280.	1		1335	164	3.	1		1950	239	0.
1		0110	15	1.	1		0725	90	1187.	1		1340	165	3.	1		1955	240	0.
1		0115	16	2.	1		0730	91	1101.	1		1345	166	2.	1		2000	241	0.
1		0120	17	2.	1		0735	92	1021.	1		1350	167	2.	1		2005	242	0.
1		0125	18	2.	1		0740	93	946.	1		1355	168	2.	1		2010	243	0.
1		0130	19	2.	1		0745	94	878.	1		1400	169	2.	1		2015	244	0.
1		0135	20	3.	1		0750	95	815.	1		1405	170	2.	1		2020	245	0.
1		0140	21	3.	1		0755	96	757.	1		1410	171	1.	1		2025	246	0.
1		0145	22	4.	1		0800	97	702.	1		1415	172	1.	1		2030	247	0.
1		0150	23	4.	1		0805	98	652.	1		1420	173	1.	1		2035	248	0.
1		0155	24	5.	1		0810	99	605.	1		1425	174	1.	1		2040	249	0.
1		0200	25	6.	1		0815	100	561.	1		1430	175	1.	1		2045	250	0.
1		0205	26	7.	1		0820	101	521.	1		1435	176	1.	1		2050	251	0.
1		0210	27	8.	1		0825	102	484.	1		1440	177	1.	1		2055	252	0.
1		0215	28	9.	1		0830	103	448.	1		1445	178	1.	1		2100	253	0.
1		0220	29	11.	1		0835	104	415.	1		1450	179	1.	1		2105	254	0.
1		0225	30	13.	1		0840	105	385.	1		1455	180	0.	1		2110	255	0.
1		0230	31	15.	1		0845	106	357.	1		1500	181	0.	1		2115	256	0.
1		0235	32	18.	1		0850	107	331.	1		1505	182	0.	1		2120	257	0.
1		0240	33	20.	1		0855	108	307.	1		1510	183	0.	1		2125	258	0.
1		0245	34	23.	1		0900	109	284.	1		1515	184	0.	1		2130	259	0.
1		0250	35	26.	1		0905	110	263.	1		1520	185	0.	1		2135	260	0.
1		0255	36	29.	1		0910	111	244.	1		1525	186	0.	1		2140	261	0.
1		0300	37	34.	1		0915	112	225.	1		1530	187	0.	1		2145	262	0.
1		0305	38	41.	1		0920	113	208.	1		1535	188	0.	1		2150	263	0.
1		0310	39	52.	1		0925	114	191.	1		1540	189	0.	1		2155	264	0.
1		0315	40	68.	1		0930	115	176.	1		1545	190	0.	1		2200	265	0.
1		0320	41	90.	1		0935	116	163.	1		1550	191	0.	1		2205	266	0.
1		0325	42	122.	1		0940	117	150.	1		1555	192	0.	1		2210	267	0.
1		0330	43	169.	1		0945	118	138.	1		1600	193	0.	1		2215	268	0.
1		0335	44	232.	1		0950	119	128.	1		1605	194	0.	1		2220	269	0.
1		0340	45	313.	1		0955	120	118.	1		1610	195	0.	1		2225	270	0.
1		0345	46	405.	1		1000	121	109.	1		1615	196	0.	1		2230	271	0.
1		0350	47	506.	1		1005	122	101.	1		1620	197	0.	1		2235	272	0.
1		0355	48	670.	1		1010	123	93.	1		1625	198	0.	1		2240	273	0.
1		0400	49	877.	1		1015	124	86.	1		1630	199	0.	1		2245	274	0.
1		0405	50	1064.	1		1020	125	80.	1		1635	200	0.	1		2250	275	0.
1		0410	51	1199.	1		1025	126	74.	1		1640	201	0.	1		2255	276	0.
1		0415	52	1320.	1		1030	127	69.	1		1645	202	0.	1		2300	277	0.
1		0420	53	1699.	1		1035	128	64.	1		1650	203	0.	1		2305	278	0.
1		0425	54	2819.	1		1040	129	60.	1		1655	204	0.	1		2310	279	0.
1		0430	55	4056.	1		1045	130	56.	1		1700	205	0.	1		2315	280	0.
1		0435	56	4526.	1		1050	131	52.	1		1705	206	0.	1		2320	281	0.
1		0440	57	4609.	1		1055	132	49.	1		1710	207	0.	1		2325	282	0.
1		0445	58	4614.	1		1100	133	45.	1		1715	208	0.	1		2330	283	0.
1		0450	59	4500.	1		1105	134	42.	1		1720	209	0.	1		2335	284	0.
1		0455	60	4362.	1		1110	135	39.	1		1725	210	0.	1		2340	285	0.
1		0500	61	4228.	1		1115	136	37.	1		1730	211	0.	1		2345	286	0.
1		0505	62	4112.	1		1120	137	34.	1		1735	212	0.	1		2350	287	0.

1	0510	63	4030.	*	1	1125	138	32.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	3988.	*	1	1130	139	29.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	3990.	*	1	1135	140	27.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	4021.	*	1	1140	141	25.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	4070.	*	1	1145	142	23.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	4140.	*	1	1150	143	21.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	4229.	*	1	1155	144	19.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	4306.	*	1	1200	145	17.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	4324.	*	1	1205	146	16.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	4251.	*	1	1210	147	14.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	4096.	*	1	1215	148	13.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	3893.	*	1	1220	149	12.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	3670.	*	1	1225	150	11.	*	1	1840	225	0.	*	2	0055	300	0.

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PEAK FLOW (CFS)	TIME (HR)	MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
+		(CFS)			
+ 4614.	4.75	2002.	511.	492.	492.
		(INCHES) .316	.323	.323	.323
		(AC-FT) 992.	1013.	1013.	1013.

CUMULATIVE AREA = 58.84 SQ MI

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HYDROGRAPH AT STATION ULWIN
SUM OF 4 HYDROGRAPHS
PLAN 1, RATIO = .44

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DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	1973.	1		1230	151	13.	1		1845	226	0.
1		0005	2	0.	1		0620	77	1872.	1		1235	152	12.	1		1850	227	0.
1		0010	3	0.	1		0625	78	1757.	1		1240	153	12.	1		1855	228	0.
1		0015	4	0.	1		0630	79	1638.	1		1245	154	11.	1		1900	229	0.
1		0020	5	0.	1		0635	80	1542.	1		1250	155	10.	1		1905	230	0.
1		0025	6	0.	1		0640	81	1465.	1		1255	156	9.	1		1910	231	0.
1		0030	7	0.	1		0645	82	1379.	1		1300	157	8.	1		1915	232	0.
1		0035	8	0.	1		0650	83	1290.	1		1305	158	8.	1		1920	233	0.
1		0040	9	0.	1		0655	84	1211.	1		1310	159	7.	1		1925	234	0.
1		0045	10	0.	1		0700	85	1134.	1		1315	160	7.	1		1930	235	0.
1		0050	11	0.	1		0705	86	1050.	1		1320	161	6.	1		1935	236	0.
1		0055	12	0.	1		0710	87	973.	1		1325	162	6.	1		1940	237	0.
1		0100	13	0.	1		0715	88	909.	1		1330	163	5.	1		1945	238	0.
1		0105	14	0.	1		0720	89	846.	1		1335	164	5.	1		1950	239	0.
1		0110	15	0.	1		0725	90	788.	1		1340	165	5.	1		1955	240	0.
1		0115	16	0.	1		0730	91	739.	1		1345	166	4.	1		2000	241	0.
1		0120	17	0.	1		0735	92	691.	1		1350	167	4.	1		2005	242	0.
1		0125	18	0.	1		0740	93	645.	1		1355	168	4.	1		2010	243	0.
1		0130	19	1.	1		0745	94	606.	1		1400	169	3.	1		2015	244	0.
1		0135	20	1.	1		0750	95	567.	1		1405	170	3.	1		2020	245	0.
1		0140	21	1.	1		0755	96	529.	1		1410	171	3.	1		2025	246	0.
1		0145	22	1.	1		0800	97	497.	1		1415	172	3.	1		2030	247	0.
1		0150	23	2.	1		0805	98	464.	1		1420	173	2.	1		2035	248	0.
1		0155	24	2.	1		0810	99	435.	1		1425	174	2.	1		2040	249	0.
1		0200	25	2.	1		0815	100	408.	1		1430	175	2.	1		2045	250	0.
1		0205	26	3.	1		0820	101	381.	1		1435	176	2.	1		2050	251	0.
1		0210	27	3.	1		0825	102	358.	1		1440	177	2.	1		2055	252	0.
1		0215	28	3.	1		0830	103	336.	1		1445	178	2.	1		2100	253	0.
1		0220	29	4.	1		0835	104	315.	1		1450	179	2.	1		2105	254	0.
1		0225	30	4.	1		0840	105	295.	1		1455	180	1.	1		2110	255	0.
1		0230	31	4.	1		0845	106	277.	1		1500	181	1.	1		2115	256	0.
1		0235	32	4.	1		0850	107	259.	1		1505	182	1.	1		2120	257	0.
1		0240	33	4.	1		0855	108	244.	1		1510	183	1.	1		2125	258	0.
1		0245	34	4.	1		0900	109	229.	1		1515	184	1.	1		2130	259	0.
1		0250	35	4.	1		0905	110	215.	1		1520	185	1.	1		2135	260	0.
1		0255	36	5.	1		0910	111	203.	1		1525	186	1.	1		2140	261	0.
1		0300	37	5.	1		0915	112	190.	1		1530	187	1.	1		2145	262	0.
1		0305	38	7.	1		0920	113	177.	1		1535	188	1.	1		2150	263	0.
1		0310	39	9.	1		0925	114	166.	1		1540	189	1.	1		2155	264	0.
1		0315	40	13.	1		0930	115	155.	1		1545	190	1.	1		2200	265	0.
1		0320	41	19.	1		0935	116	145.	1		1550	191	1.	1		2205	266	0.
1		0325	42	28.	1		0940	117	135.	1		1555	192	1.	1		2210	267	0.
1		0330	43	45.	1		0945	118	126.	1		1600	193	0.	1		2215	268	0.
1		0335	44	70.	1		0950	119	118.	1		1605	194	0.	1		2220	269	0.

1	0340	45	103.	*	1	0955	120	110.	*	1	1610	195	0.	*	1	2225	270	0.
1	0345	46	142.	*	1	1000	121	102.	*	1	1615	196	0.	*	1	2230	271	0.
1	0350	47	183.	*	1	1005	122	96.	*	1	1620	197	0.	*	1	2235	272	0.
1	0355	48	223.	*	1	1010	123	89.	*	1	1625	198	0.	*	1	2240	273	0.
1	0400	49	261.	*	1	1015	124	83.	*	1	1630	199	0.	*	1	2245	274	0.
1	0405	50	300.	*	1	1020	125	77.	*	1	1635	200	0.	*	1	2250	275	0.
1	0410	51	400.	*	1	1025	126	72.	*	1	1640	201	0.	*	1	2255	276	0.
1	0415	52	499.	*	1	1030	127	67.	*	1	1645	202	0.	*	1	2300	277	0.
1	0420	53	537.	*	1	1035	128	63.	*	1	1650	203	0.	*	1	2305	278	0.
1	0425	54	561.	*	1	1040	129	58.	*	1	1655	204	0.	*	1	2310	279	0.
1	0430	55	564.	*	1	1045	130	55.	*	1	1700	205	0.	*	1	2315	280	0.
1	0435	56	562.	*	1	1050	131	51.	*	1	1705	206	0.	*	1	2320	281	0.
1	0440	57	683.	*	1	1055	132	48.	*	1	1710	207	0.	*	1	2325	282	0.
1	0445	58	1983.	*	1	1100	133	44.	*	1	1715	208	0.	*	1	2330	283	0.
1	0450	59	2809.	*	1	1105	134	42.	*	1	1720	209	0.	*	1	2335	284	0.
1	0455	60	1949.	*	1	1110	135	39.	*	1	1725	210	0.	*	1	2340	285	0.
1	0500	61	2373.	*	1	1115	136	36.	*	1	1730	211	0.	*	1	2345	286	0.
1	0505	62	2370.	*	1	1120	137	34.	*	1	1735	212	0.	*	1	2350	287	0.
1	0510	63	2112.	*	1	1125	138	32.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	2252.	*	1	1130	139	30.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	2081.	*	1	1135	140	28.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	2116.	*	1	1140	141	26.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	2065.	*	1	1145	142	25.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	2036.	*	1	1150	143	23.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	2068.	*	1	1155	144	22.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	2117.	*	1	1200	145	20.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	2198.	*	1	1205	146	19.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	2258.	*	1	1210	147	18.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	2271.	*	1	1215	148	17.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	2188.	*	1	1220	149	16.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	2074.	*	1	1225	150	14.	*	1	1840	225	0.	*	2	0055	300	0.

****

PEAK FLOW (CFS)	TIME (HR)	MAXIMUM AVERAGE FLOW (CFS)	6-HR	24-HR	72-HR	24.92-HR
+ 2809.	4.83		1024.	264.	254.	254.
		(INCHES)	.162	.167	.167	.167
		(AC-FT)	508.	523.	523.	523.

CUMULATIVE AREA = 58.84 SQ MI

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HYDROGRAPH AT STATION ULWIN
SUM OF 4 HYDROGRAPHS
PLAN 1, RATIO = .26

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DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	364.	1		1230	151	8.	1		1845	226	0.
1		0005	2	0.	1		0620	77	385.	1		1235	152	8.	1		1850	227	0.
1		0010	3	0.	1		0625	78	499.	1		1240	153	7.	1		1855	228	0.
1		0015	4	0.	1		0630	79	406.	1		1245	154	7.	1		1900	229	0.
1		0020	5	0.	1		0635	80	494.	1		1250	155	6.	1		1905	230	0.
1		0025	6	0.	1		0640	81	464.	1		1255	156	6.	1		1910	231	0.
1		0030	7	0.	1		0645	82	404.	1		1300	157	6.	1		1915	232	0.
1		0035	8	0.	1		0650	83	436.	1		1305	158	5.	1		1920	233	0.
1		0040	9	0.	1		0655	84	378.	1		1310	159	5.	1		1925	234	0.
1		0045	10	0.	1		0700	85	367.	1		1315	160	5.	1		1930	235	0.
1		0050	11	0.	1		0705	86	350.	1		1320	161	5.	1		1935	236	0.
1		0055	12	0.	1		0710	87	317.	1		1325	162	4.	1		1940	237	0.
1		0100	13	0.	1		0715	88	319.	1		1330	163	4.	1		1945	238	0.
1		0105	14	0.	1		0720	89	288.	1		1335	164	4.	1		1950	239	0.
1		0110	15	0.	1		0725	90	269.	1		1340	165	4.	1		1955	240	0.
1		0115	16	0.	1		0730	91	260.	1		1345	166	4.	1		2000	241	0.
1		0120	17	0.	1		0735	92	238.	1		1350	167	4.	1		2005	242	0.
1		0125	18	0.	1		0740	93	229.	1		1355	168	3.	1		2010	243	0.
1		0130	19	0.	1		0745	94	215.	1		1400	169	3.	1		2015	244	0.
1		0135	20	0.	1		0750	95	202.	1		1405	170	3.	1		2020	245	0.
1		0140	21	0.	1		0755	96	196.	1		1410	171	3.	1		2025	246	0.
1		0145	22	0.	1		0800	97	184.	1		1415	172	3.	1		2030	247	0.
1		0150	23	0.	1		0805	98	173.	1		1420	173	3.	1		2035	248	0.
1		0155	24	0.	1		0810	99	161.	1		1425	174	3.	1		2040	249	0.
1		0200	25	0.	1		0815	100	150.	1		1430	175	2.	1		2045	250	0.
1		0205	26	0.	1		0820	101	138.	1		1435	176	2.	1		2050	251	0.

1	0210	27	0.	*	1	0825	102	129.	*	1	1440	177	2.	*	1	2055	252	0.
1	0215	28	0.	*	1	0830	103	124.	*	1	1445	178	2.	*	1	2100	253	0.
1	0220	29	0.	*	1	0835	104	119.	*	1	1450	179	2.	*	1	2105	254	0.
1	0225	30	0.	*	1	0840	105	114.	*	1	1455	180	2.	*	1	2110	255	0.
1	0230	31	0.	*	1	0845	106	109.	*	1	1500	181	2.	*	1	2115	256	0.
1	0235	32	0.	*	1	0850	107	102.	*	1	1505	182	2.	*	1	2120	257	0.
1	0240	33	0.	*	1	0855	108	93.	*	1	1510	183	2.	*	1	2125	258	0.
1	0245	34	0.	*	1	0900	109	86.	*	1	1515	184	1.	*	1	2130	259	0.
1	0250	35	0.	*	1	0905	110	84.	*	1	1520	185	1.	*	1	2135	260	0.
1	0255	36	0.	*	1	0910	111	83.	*	1	1525	186	1.	*	1	2140	261	0.
1	0300	37	1.	*	1	0915	112	82.	*	1	1530	187	1.	*	1	2145	262	0.
1	0305	38	1.	*	1	0920	113	78.	*	1	1535	188	1.	*	1	2150	263	0.
1	0310	39	1.	*	1	0925	114	73.	*	1	1540	189	1.	*	1	2155	264	0.
1	0315	40	2.	*	1	0930	115	69.	*	1	1545	190	1.	*	1	2200	265	0.
1	0320	41	3.	*	1	0935	116	65.	*	1	1550	191	1.	*	1	2205	266	0.
1	0325	42	4.	*	1	0940	117	63.	*	1	1555	192	1.	*	1	2210	267	0.
1	0330	43	5.	*	1	0945	118	59.	*	1	1600	193	1.	*	1	2215	268	0.
1	0335	44	7.	*	1	0950	119	55.	*	1	1605	194	1.	*	1	2220	269	0.
1	0340	45	10.	*	1	0955	120	51.	*	1	1610	195	1.	*	1	2225	270	0.
1	0345	46	12.	*	1	1000	121	48.	*	1	1615	196	1.	*	1	2230	271	0.
1	0350	47	15.	*	1	1005	122	46.	*	1	1620	197	1.	*	1	2235	272	0.
1	0355	48	18.	*	1	1010	123	45.	*	1	1625	198	1.	*	1	2240	273	0.
1	0400	49	22.	*	1	1015	124	43.	*	1	1630	199	1.	*	1	2245	274	0.
1	0405	50	30.	*	1	1020	125	41.	*	1	1635	200	1.	*	1	2250	275	0.
1	0410	51	37.	*	1	1025	126	38.	*	1	1640	201	1.	*	1	2255	276	0.
1	0415	52	44.	*	1	1030	127	36.	*	1	1645	202	0.	*	1	2300	277	0.
1	0420	53	49.	*	1	1035	128	34.	*	1	1650	203	0.	*	1	2305	278	0.
1	0425	54	52.	*	1	1040	129	33.	*	1	1655	204	0.	*	1	2310	279	0.
1	0430	55	55.	*	1	1045	130	31.	*	1	1700	205	0.	*	1	2315	280	0.
1	0435	56	57.	*	1	1050	131	28.	*	1	1705	206	0.	*	1	2320	281	0.
1	0440	57	59.	*	1	1055	132	27.	*	1	1710	207	0.	*	1	2325	282	0.
1	0445	58	61.	*	1	1100	133	25.	*	1	1715	208	0.	*	1	2330	283	0.
1	0450	59	69.	*	1	1105	134	24.	*	1	1720	209	0.	*	1	2335	284	0.
1	0455	60	90.	*	1	1110	135	22.	*	1	1725	210	0.	*	1	2340	285	0.
1	0500	61	87.	*	1	1115	136	21.	*	1	1730	211	0.	*	1	2345	286	0.
1	0505	62	89.	*	1	1120	137	19.	*	1	1735	212	0.	*	1	2350	287	0.
1	0510	63	96.	*	1	1125	138	18.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	95.	*	1	1130	139	17.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	99.	*	1	1135	140	16.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	101.	*	1	1140	141	15.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	103.	*	1	1145	142	14.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	107.	*	1	1150	143	13.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	111.	*	1	1155	144	12.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	114.	*	1	1200	145	11.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	244.	*	1	1205	146	11.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	538.	*	1	1210	147	10.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	368.	*	1	1215	148	10.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	257.	*	1	1220	149	9.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	494.	*	1	1225	150	8.	*	1	1840	225	0.	*	2	0055	300	0.
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  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                      6-HR       24-HR       72-HR     24.92-HR
+   (CFS)       (HR)
                             (CFS)
+     538.      5.92                  182.         49.         47.          47.
                          (INCHES)    .029        .031        .031         .031
                           (AC-FT)     90.         96.         96.          96.

                           CUMULATIVE AREA =   58.84 SQ MI



*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


               **************
               *            *
 1305 KK       *    FINISH  *
               *            *
               **************

 1307 KO            OUTPUT CONTROL VARIABLES
                          IPRNT           1  PRINT CONTROL
                          IPLOT           0  PLOT CONTROL
                          QSCAL          0.  HYDROGRAPH PLOT SCALE

                  HYDROGRAPH ROUTING DATA
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1306 RD MUSKINGUM-CUNGE CHANNEL ROUTING

L	1500.	CHANNEL LENGTH
S	.0090	SLOPE
N	.050	CHANNEL ROUGHNESS COEFFICIENT
CA	.00	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	250.00	BOTTOM WIDTH OR DIAMETER
Z	3.00	SIDE SLOPE

***

COMPUTED MUSKINGUM-CUNGE PARAMETERS

ELEMENT	ALPHA	M	COMPUTATION TIME STEP DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	.08	1.64	2.52	750.00	10469.42	380.98	1.11	9.91
INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL								
MAIN	.08	1.64	5.00		10457.09	380.00	1.11	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5277E+04 EXCESS= .0000E+00 OUTFLOW= .5277E+04 BASIN STORAGE= .1001E-01 PERCENT ERROR= .0

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HYDROGRAPH AT STATION FINISH
PLAN 1, RATIO = 1.00

****

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	10332.	1		1230	151	2680.	1		1845	226	174.
1		0005	2	0.	1		0620	77	10457.	1		1235	152	2656.	1		1850	227	137.
1		0010	3	0.	1		0625	78	10447.	1		1240	153	2632.	1		1855	228	105.
1		0015	4	0.	1		0630	79	10328.	1		1245	154	2608.	1		1900	229	79.
1		0020	5	0.	1		0635	80	10127.	1		1250	155	2584.	1		1905	230	59.
1		0025	6	0.	1		0640	81	9863.	1		1255	156	2560.	1		1910	231	44.
1		0030	7	0.	1		0645	82	9553.	1		1300	157	2536.	1		1915	232	33.
1		0035	8	1.	1		0650	83	9210.	1		1305	158	2513.	1		1920	233	25.
1		0040	9	3.	1		0655	84	8846.	1		1310	159	2489.	1		1925	234	18.
1		0045	10	6.	1		0700	85	8468.	1		1315	160	2464.	1		1930	235	14.
1		0050	11	11.	1		0705	86	8081.	1		1320	161	2438.	1		1935	236	10.
1		0055	12	19.	1		0710	87	7692.	1		1325	162	2412.	1		1940	237	8.
1		0100	13	30.	1		0715	88	7305.	1		1330	163	2387.	1		1945	238	6.
1		0105	14	43.	1		0720	89	6923.	1		1335	164	2361.	1		1950	239	4.
1		0110	15	60.	1		0725	90	6548.	1		1340	165	2336.	1		1955	240	3.
1		0115	16	78.	1		0730	91	6180.	1		1345	166	2311.	1		2000	241	2.
1		0120	17	97.	1		0735	92	5822.	1		1350	167	2284.	1		2005	242	2.
1		0125	18	118.	1		0740	93	5474.	1		1355	168	2256.	1		2010	243	1.
1		0130	19	139.	1		0745	94	5148.	1		1400	169	2228.	1		2015	244	1.
1		0135	20	163.	1		0750	95	4871.	1		1405	170	2200.	1		2020	245	1.
1		0140	21	190.	1		0755	96	4675.	1		1410	171	2172.	1		2025	246	1.
1		0145	22	222.	1		0800	97	4553.	1		1415	172	2145.	1		2030	247	0.
1		0150	23	259.	1		0805	98	4463.	1		1420	173	2117.	1		2035	248	0.
1		0155	24	303.	1		0810	99	4380.	1		1425	174	2088.	1		2040	249	0.
1		0200	25	355.	1		0815	100	4303.	1		1430	175	2056.	1		2045	250	0.
1		0205	26	414.	1		0820	101	4230.	1		1435	176	2025.	1		2050	251	0.
1		0210	27	482.	1		0825	102	4161.	1		1440	177	1994.	1		2055	252	0.
1		0215	28	557.	1		0830	103	4096.	1		1445	178	1963.	1		2100	253	0.
1		0220	29	637.	1		0835	104	4035.	1		1450	179	1932.	1		2105	254	0.
1		0225	30	724.	1		0840	105	3977.	1		1455	180	1900.	1		2110	255	0.
1		0230	31	815.	1		0845	106	3922.	1		1500	181	1866.	1		2115	256	0.
1		0235	32	900.	1		0850	107	3871.	1		1505	182	1831.	1		2120	257	0.
1		0240	33	972.	1		0855	108	3821.	1		1510	183	1795.	1		2125	258	0.
1		0245	34	1029.	1		0900	109	3775.	1		1515	184	1761.	1		2130	259	0.
1		0250	35	1079.	1		0905	110	3731.	1		1520	185	1727.	1		2135	260	0.
1		0255	36	1131.	1		0910	111	3690.	1		1525	186	1692.	1		2140	261	0.
1		0300	37	1196.	1		0915	112	3651.	1		1530	187	1656.	1		2145	262	0.
1		0305	38	1285.	1		0920	113	3614.	1		1535	188	1618.	1		2150	263	0.
1		0310	39	1411.	1		0925	114	3580.	1		1540	189	1581.	1		2155	264	0.
1		0315	40	1584.	1		0930	115	3546.	1		1545	190	1545.	1		2200	265	0.
1		0320	41	1817.	1		0935	116	3513.	1		1550	191	1509.	1		2205	266	0.
1		0325	42	2133.	1		0940	117	3481.	1		1555	192	1473.	1		2210	267	0.
1		0330	43	2561.	1		0945	118	3450.	1		1600	193	1435.	1		2215	268	0.

1	0335	44	3124.	*	1	0950	119	3420.	*	1	1605	194	1397.	*	1	2220	269	0.
1	0340	45	3801.	*	1	0955	120	3392.	*	1	1610	195	1358.	*	1	2225	270	0.
1	0345	46	4553.	*	1	1000	121	3364.	*	1	1615	196	1321.	*	1	2230	271	0.
1	0350	47	5360.	*	1	1005	122	3338.	*	1	1620	197	1284.	*	1	2235	272	0.
1	0355	48	6184.	*	1	1010	123	3312.	*	1	1625	198	1247.	*	1	2240	273	0.
1	0400	49	6952.	*	1	1015	124	3287.	*	1	1630	199	1209.	*	1	2245	274	0.
1	0405	50	7609.	*	1	1020	125	3263.	*	1	1635	200	1169.	*	1	2250	275	0.
1	0410	51	8148.	*	1	1025	126	3238.	*	1	1640	201	1130.	*	1	2255	276	0.
1	0415	52	8589.	*	1	1030	127	3214.	*	1	1645	202	1092.	*	1	2300	277	0.
1	0420	53	8935.	*	1	1035	128	3189.	*	1	1650	203	1054.	*	1	2305	278	0.
1	0425	54	9172.	*	1	1040	129	3166.	*	1	1655	204	1018.	*	1	2310	279	0.
1	0430	55	9300.	*	1	1045	130	3143.	*	1	1700	205	980.	*	1	2315	280	0.
1	0435	56	9351.	*	1	1050	131	3120.	*	1	1705	206	941.	*	1	2320	281	0.
1	0440	57	9361.	*	1	1055	132	3098.	*	1	1710	207	901.	*	1	2325	282	0.
1	0445	58	9355.	*	1	1100	133	3077.	*	1	1715	208	862.	*	1	2330	283	0.
1	0450	59	9376.	*	1	1105	134	3056.	*	1	1720	209	825.	*	1	2335	284	0.
1	0455	60	9464.	*	1	1110	135	3034.	*	1	1725	210	790.	*	1	2340	285	0.
1	0500	61	9614.	*	1	1115	136	3012.	*	1	1730	211	755.	*	1	2345	286	0.
1	0505	62	9791.	*	1	1120	137	2989.	*	1	1735	212	717.	*	1	2350	287	0.
1	0510	63	9969.	*	1	1125	138	2967.	*	1	1740	213	677.	*	1	2355	288	0.
1	0515	64	10125.	*	1	1130	139	2945.	*	1	1745	214	637.	*	2	0000	289	0.
1	0520	65	10228.	*	1	1135	140	2924.	*	1	1750	215	598.	*	2	0005	290	0.
1	0525	66	10256.	*	1	1140	141	2902.	*	1	1755	216	560.	*	2	0010	291	0.
1	0530	67	10211.	*	1	1145	142	2881.	*	1	1800	217	525.	*	2	0015	292	0.
1	0535	68	10100.	*	1	1150	143	2860.	*	1	1805	218	489.	*	2	0020	293	0.
1	0540	69	9933.	*	1	1155	144	2837.	*	1	1810	219	448.	*	2	0025	294	0.
1	0545	70	9719.	*	1	1200	145	2814.	*	1	1815	220	400.	*	2	0030	295	0.
1	0550	71	9479.	*	1	1205	146	2791.	*	1	1820	221	354.	*	2	0035	296	0.
1	0555	72	9282.	*	1	1210	147	2769.	*	1	1825	222	313.	*	2	0040	297	0.
1	0600	73	9291.	*	1	1215	148	2746.	*	1	1830	223	277.	*	2	0045	298	0.
1	0605	74	9603.	*	1	1220	149	2724.	*	1	1835	224	244.	*	2	0050	299	0.
1	0610	75	10033.	*	1	1225	150	2702.	*	1	1840	225	210.	*	2	0055	300	0.

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 10457.	6.33		7198.	2660.	2563.	2563.
		(INCHES)	.753	1.113	1.113	1.113
		(AC-FT)	3569.	5277.	5277.	5277.

CUMULATIVE AREA = 88.86 SQ MI

COMPUTED MUSKINGUM-CUNGE PARAMETERS

ELEMENT	ALPHA	M	COMPUTATION TIME STEP DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	.08	1.64	2.74	750.00	8495.68	325.77	.86	9.13

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

MAIN	.08	1.64	5.00		8491.82	325.00	.86

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4077E+04 EXCESS= .0000E+00 OUTFLOW= .4077E+04 BASIN STORAGE= .1037E-01 PERCENT ERROR= .0

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HYDROGRAPH AT STATION FINISH
PLAN 1, RATIO = .87

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DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	6922.	1		1230	151	2309.	1		1845	226	3.
1		0005	2	0.	1		0620	77	6739.	1		1235	152	2280.	1		1850	227	2.
1		0010	3	0.	1		0625	78	6561.	1		1240	153	2251.	1		1855	228	2.
1		0015	4	0.	1		0630	79	6387.	1		1245	154	2222.	1		1900	229	1.
1		0020	5	0.	1		0635	80	6218.	1		1250	155	2194.	1		1905	230	1.
1		0025	6	0.	1		0640	81	6052.	1		1255	156	2166.	1		1910	231	1.
1		0030	7	0.	1		0645	82	5890.	1		1300	157	2137.	1		1915	232	1.
1		0035	8	0.	1		0650	83	5734.	1		1305	158	2108.	1		1920	233	0.

1	0040	9	0.	*	1	0655	84	5585.	*	1	1310	159	2077.	*	1	1925	234	0.
1	0045	10	1.	*	1	0700	85	5442.	*	1	1315	160	2044.	*	1	1930	235	0.
1	0050	11	2.	*	1	0705	86	5304.	*	1	1320	161	2012.	*	1	1935	236	0.
1	0055	12	4.	*	1	0710	87	5173.	*	1	1325	162	1981.	*	1	1940	237	0.
1	0100	13	7.	*	1	0715	88	5049.	*	1	1330	163	1950.	*	1	1945	238	0.
1	0105	14	12.	*	1	0720	89	4930.	*	1	1335	164	1918.	*	1	1950	239	0.
1	0110	15	17.	*	1	0725	90	4818.	*	1	1340	165	1884.	*	1	1955	240	0.
1	0115	16	24.	*	1	0730	91	4709.	*	1	1345	166	1849.	*	1	2000	241	0.
1	0120	17	33.	*	1	0735	92	4604.	*	1	1350	167	1813.	*	1	2005	242	0.
1	0125	18	42.	*	1	0740	93	4502.	*	1	1355	168	1778.	*	1	2010	243	0.
1	0130	19	54.	*	1	0745	94	4405.	*	1	1400	169	1743.	*	1	2015	244	0.
1	0135	20	67.	*	1	0750	95	4313.	*	1	1405	170	1708.	*	1	2020	245	0.
1	0140	21	83.	*	1	0755	96	4226.	*	1	1410	171	1672.	*	1	2025	246	0.
1	0145	22	102.	*	1	0800	97	4145.	*	1	1415	172	1635.	*	1	2030	247	0.
1	0150	23	125.	*	1	0805	98	4070.	*	1	1420	173	1597.	*	1	2035	248	0.
1	0155	24	153.	*	1	0810	99	3999.	*	1	1425	174	1560.	*	1	2040	249	0.
1	0200	25	185.	*	1	0815	100	3934.	*	1	1430	175	1524.	*	1	2045	250	0.
1	0205	26	223.	*	1	0820	101	3872.	*	1	1435	176	1488.	*	1	2050	251	0.
1	0210	27	266.	*	1	0825	102	3814.	*	1	1440	177	1451.	*	1	2055	252	0.
1	0215	28	312.	*	1	0830	103	3758.	*	1	1445	178	1413.	*	1	2100	253	0.
1	0220	29	362.	*	1	0835	104	3706.	*	1	1450	179	1374.	*	1	2105	254	0.
1	0225	30	414.	*	1	0840	105	3657.	*	1	1455	180	1337.	*	1	2110	255	0.
1	0230	31	466.	*	1	0845	106	3609.	*	1	1500	181	1300.	*	1	2115	256	0.
1	0235	32	517.	*	1	0850	107	3564.	*	1	1505	182	1263.	*	1	2120	257	0.
1	0240	33	564.	*	1	0855	108	3521.	*	1	1510	183	1225.	*	1	2125	258	0.
1	0245	34	608.	*	1	0900	109	3479.	*	1	1515	184	1186.	*	1	2130	259	0.
1	0250	35	649.	*	1	0905	110	3438.	*	1	1520	185	1146.	*	1	2135	260	0.
1	0255	36	691.	*	1	0910	111	3399.	*	1	1525	186	1107.	*	1	2140	261	0.
1	0300	37	739.	*	1	0915	112	3362.	*	1	1530	187	1070.	*	1	2145	262	0.
1	0305	38	798.	*	1	0920	113	3327.	*	1	1535	188	1033.	*	1	2150	263	0.
1	0310	39	873.	*	1	0925	114	3293.	*	1	1540	189	996.	*	1	2155	264	0.
1	0315	40	980.	*	1	0930	115	3261.	*	1	1545	190	957.	*	1	2200	265	0.
1	0320	41	1135.	*	1	0935	116	3230.	*	1	1550	191	917.	*	1	2205	266	0.
1	0325	42	1362.	*	1	0940	117	3200.	*	1	1555	192	878.	*	1	2210	267	0.
1	0330	43	1693.	*	1	0945	118	3170.	*	1	1600	193	841.	*	1	2215	268	0.
1	0335	44	2140.	*	1	0950	119	3141.	*	1	1605	194	805.	*	1	2220	269	0.
1	0340	45	2685.	*	1	0955	120	3111.	*	1	1610	195	769.	*	1	2225	270	0.
1	0345	46	3290.	*	1	1000	121	3082.	*	1	1615	196	733.	*	1	2230	271	0.
1	0350	47	3939.	*	1	1005	122	3054.	*	1	1620	197	694.	*	1	2235	272	0.
1	0355	48	4614.	*	1	1010	123	3027.	*	1	1625	198	655.	*	1	2240	273	0.
1	0400	49	5249.	*	1	1015	124	3000.	*	1	1630	199	616.	*	1	2245	274	0.
1	0405	50	5789.	*	1	1020	125	2974.	*	1	1635	200	580.	*	1	2250	275	0.
1	0410	51	6232.	*	1	1025	126	2949.	*	1	1640	201	546.	*	1	2255	276	0.
1	0415	52	6597.	*	1	1030	127	2924.	*	1	1645	202	512.	*	1	2300	277	0.
1	0420	53	6899.	*	1	1035	128	2898.	*	1	1650	203	477.	*	1	2305	278	0.
1	0425	54	7132.	*	1	1040	129	2872.	*	1	1655	204	437.	*	1	2310	279	0.
1	0430	55	7297.	*	1	1045	130	2846.	*	1	1700	205	394.	*	1	2315	280	0.
1	0435	56	7405.	*	1	1050	131	2820.	*	1	1705	206	352.	*	1	2320	281	0.
1	0440	57	7473.	*	1	1055	132	2795.	*	1	1710	207	313.	*	1	2325	282	0.
1	0445	58	7516.	*	1	1100	133	2771.	*	1	1715	208	278.	*	1	2330	283	0.
1	0450	59	7570.	*	1	1105	134	2747.	*	1	1720	209	247.	*	1	2335	284	0.
1	0455	60	7676.	*	1	1110	135	2723.	*	1	1725	210	215.	*	1	2340	285	0.
1	0500	61	7831.	*	1	1115	136	2698.	*	1	1730	211	180.	*	1	2345	286	0.
1	0505	62	8005.	*	1	1120	137	2672.	*	1	1735	212	143.	*	1	2350	287	0.
1	0510	63	8178.	*	1	1125	138	2647.	*	1	1740	213	110.	*	1	2355	288	0.
1	0515	64	8334.	*	1	1130	139	2621.	*	1	1745	214	83.	*	2	0000	289	0.
1	0520	65	8445.	*	1	1135	140	2596.	*	1	1750	215	63.	*	2	0005	290	0.
1	0525	66	8492.	*	1	1140	141	2571.	*	1	1755	216	47.	*	2	0010	291	0.
1	0530	67	8477.	*	1	1145	142	2546.	*	1	1800	217	36.	*	2	0015	292	0.
1	0535	68	8407.	*	1	1150	143	2521.	*	1	1805	218	27.	*	2	0020	293	0.
1	0540	69	8292.	*	1	1155	144	2495.	*	1	1810	219	20.	*	2	0025	294	0.
1	0545	70	8137.	*	1	1200	145	2468.	*	1	1815	220	15.	*	2	0030	295	0.
1	0550	71	7953.	*	1	1205	146	2441.	*	1	1820	221	12.	*	2	0035	296	0.
1	0555	72	7751.	*	1	1210	147	2415.	*	1	1825	222	9.	*	2	0040	297	0.
1	0600	73	7541.	*	1	1215	148	2388.	*	1	1830	223	7.	*	2	0045	298	0.
1	0605	74	7327.	*	1	1220	149	2362.	*	1	1835	224	5.	*	2	0050	299	0.
1	0610	75	7119.	*	1	1225	150	2336.	*	1	1840	225	4.	*	2	0055	300	0.
				*					*					*				

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 8492.	5.42		5613.	2056.	1980.	1980.
		(INCHES)	.587	.860	.860	.860
		(AC-FT)	2783.	4077.	4077.	4077.

CUMULATIVE AREA = 88.86 SQ MI

COMPUTED MUSKINGUM-CUNGE PARAMETERS

ELEMENT	ALPHA	COMPUTATION TIME STEP M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	.08	1.64	3.00	750.00	6695.21	327.36	.63	8.32

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

MAIN	.08	1.64	5.00		6693.29	330.00	.63	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2965E+04 EXCESS= .0000E+00 OUTFLOW= .2965E+04 BASIN STORAGE= .1030E-01 PERCENT ERROR= .0

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HYDROGRAPH AT STATION FINISH
PLAN 1, RATIO = .74

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DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	5633.	1		1230	151	1485.	1		1845	226	0.
1		0005	2	0.	1		0620	77	5502.	1		1235	152	1447.	1		1850	227	0.
1		0010	3	0.	1		0625	78	5375.	1		1240	153	1407.	1		1855	228	0.
1		0015	4	0.	1		0630	79	5248.	1		1245	154	1368.	1		1900	229	0.
1		0020	5	0.	1		0635	80	5123.	1		1250	155	1330.	1		1905	230	0.
1		0025	6	0.	1		0640	81	5000.	1		1255	156	1292.	1		1910	231	0.
1		0030	7	0.	1		0645	82	4880.	1		1300	157	1255.	1		1915	232	0.
1		0035	8	0.	1		0650	83	4763.	1		1305	158	1216.	1		1920	233	0.
1		0040	9	0.	1		0655	84	4651.	1		1310	159	1176.	1		1925	234	0.
1		0045	10	0.	1		0700	85	4542.	1		1315	160	1136.	1		1930	235	0.
1		0050	11	0.	1		0705	86	4436.	1		1320	161	1097.	1		1935	236	0.
1		0055	12	0.	1		0710	87	4335.	1		1325	162	1059.	1		1940	237	0.
1		0100	13	0.	1		0715	88	4239.	1		1330	163	1022.	1		1945	238	0.
1		0105	14	1.	1		0720	89	4146.	1		1335	164	984.	1		1950	239	0.
1		0110	15	2.	1		0725	90	4058.	1		1340	165	945.	1		1955	240	0.
1		0115	16	3.	1		0730	91	3972.	1		1345	166	904.	1		2000	241	0.
1		0120	17	5.	1		0735	92	3889.	1		1350	167	866.	1		2005	242	0.
1		0125	18	7.	1		0740	93	3808.	1		1355	168	828.	1		2010	243	0.
1		0130	19	11.	1		0745	94	3730.	1		1400	169	792.	1		2015	244	0.
1		0135	20	16.	1		0750	95	3656.	1		1405	170	756.	1		2020	245	0.
1		0140	21	22.	1		0755	96	3585.	1		1410	171	719.	1		2025	246	0.
1		0145	22	30.	1		0800	97	3519.	1		1415	172	679.	1		2030	247	0.
1		0150	23	42.	1		0805	98	3456.	1		1420	173	640.	1		2035	248	0.
1		0155	24	56.	1		0810	99	3396.	1		1425	174	603.	1		2040	249	0.
1		0200	25	73.	1		0815	100	3339.	1		1430	175	567.	1		2045	250	0.
1		0205	26	93.	1		0820	101	3285.	1		1435	176	534.	1		2050	251	0.
1		0210	27	118.	1		0825	102	3234.	1		1440	177	501.	1		2055	252	0.
1		0215	28	145.	1		0830	103	3184.	1		1445	178	465.	1		2100	253	0.
1		0220	29	174.	1		0835	104	3137.	1		1450	179	426.	1		2105	254	0.
1		0225	30	206.	1		0840	105	3092.	1		1455	180	384.	1		2110	255	0.
1		0230	31	237.	1		0845	106	3048.	1		1500	181	345.	1		2115	256	0.
1		0235	32	268.	1		0850	107	3006.	1		1505	182	308.	1		2120	257	0.
1		0240	33	296.	1		0855	108	2965.	1		1510	183	274.	1		2125	258	0.
1		0245	34	321.	1		0900	109	2925.	1		1515	184	243.	1		2130	259	0.
1		0250	35	343.	1		0905	110	2885.	1		1520	185	211.	1		2135	260	0.
1		0255	36	364.	1		0910	111	2846.	1		1525	186	177.	1		2140	261	0.
1		0300	37	388.	1		0915	112	2809.	1		1530	187	141.	1		2145	262	0.
1		0305	38	420.	1		0920	113	2773.	1		1535	188	109.	1		2150	263	0.
1		0310	39	464.	1		0925	114	2739.	1		1540	189	83.	1		2155	264	0.
1		0315	40	530.	1		0930	115	2705.	1		1545	190	63.	1		2200	265	0.
1		0320	41	631.	1		0935	116	2672.	1		1550	191	48.	1		2205	266	0.
1		0325	42	780.	1		0940	117	2639.	1		1555	192	36.	1		2210	267	0.
1		0330	43	991.	1		0945	118	2606.	1		1600	193	27.	1		2215	268	0.
1		0335	44	1294.	1		0950	119	2572.	1		1605	194	21.	1		2220	269	0.
1		0340	45	1676.	1		0955	120	2539.	1		1610	195	16.	1		2225	270	0.
1		0345	46	2116.	1		1000	121	2507.	1		1615	196	12.	1		2230	271	0.
1		0350	47	2614.	1		1005	122	2476.	1		1620	197	9.	1		2235	272	0.
1		0355	48	3146.	1		1010	123	2445.	1		1625	198	7.	1		2240	273	0.
1		0400	49	3658.	1		1015	124	2414.	1		1630	199	5.	1		2245	274	0.
1		0405	50	4097.	1		1020	125	2383.	1		1635	200	4.	1		2250	275	0.
1		0410	51	4450.	1		1025	126	2351.	1		1640	201	3.	1		2255	276	0.
1		0415	52	4735.	1		1030	127	2319.	1		1645	202	2.	1		2300	277	0.
1		0420	53	4958.	1		1035	128	2287.	1		1650	203	2.	1		2305	278	0.
1		0425	54	5136.	1		1040	129	2256.	1		1655	204	1.	1		2310	279	0.

1	0430	55	5290.	*	1	1045	130	2225.	*	1	1700	205	1.	*	1	2315	280	0.
1	0435	56	5426.	*	1	1050	131	2194.	*	1	1705	206	1.	*	1	2320	281	0.
1	0440	57	5542.	*	1	1055	132	2163.	*	1	1710	207	1.	*	1	2325	282	0.
1	0445	58	5639.	*	1	1100	133	2130.	*	1	1715	208	0.	*	1	2330	283	0.
1	0450	59	5737.	*	1	1105	134	2096.	*	1	1720	209	0.	*	1	2335	284	0.
1	0455	60	5862.	*	1	1110	135	2062.	*	1	1725	210	0.	*	1	2340	285	0.
1	0500	61	6020.	*	1	1115	136	2029.	*	1	1730	211	0.	*	1	2345	286	0.
1	0505	62	6190.	*	1	1120	137	1996.	*	1	1735	212	0.	*	1	2350	287	0.
1	0510	63	6356.	*	1	1125	138	1963.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	6506.	*	1	1130	139	1929.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	6618.	*	1	1135	140	1893.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	6680.	*	1	1140	141	1856.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	6693.	*	1	1145	142	1819.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	6660.	*	1	1150	143	1783.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	6587.	*	1	1155	144	1747.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	6484.	*	1	1200	145	1711.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	6358.	*	1	1205	146	1673.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	6218.	*	1	1210	147	1635.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	6070.	*	1	1215	148	1597.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	5919.	*	1	1220	149	1559.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	5772.	*	1	1225	150	1523.	*	1	1840	225	0.	*	2	0055	300	0.

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PEAK FLOW (CFS)	TIME (HR)	MAXIMUM AVERAGE FLOW (CFS)	6-HR	24-HR	72-HR	24.92-HR
+ 6693.	5.50		4476.	1495.	1440.	1440.
		(INCHES)	.468	.626	.626	.626
		(AC-FT)	2219.	2965.	2965.	2965.

CUMULATIVE AREA = 88.86 SQ MI

COMPUTED MUSKINGUM-CUNGE PARAMETERS

ELEMENT	ALPHA	M	COMPUTATION TIME STEP DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	.08	1.64	3.57	750.00	4288.43	332.07	.36	7.00
INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL								
MAIN	.08	1.64	5.00		4287.86	335.00	.36	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1684E+04 EXCESS= .0000E+00 OUTFLOW= .1684E+04 BASIN STORAGE= .1117E-01 PERCENT ERROR= .0

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HYDROGRAPH AT STATION FINISH
PLAN 1, RATIO = .57

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DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	3798.	1		1230	151	356.	1		1845	226	0.
1		0005	2	0.	1		0620	77	3732.	1		1235	152	323.	1		1850	227	0.
1		0010	3	0.	1		0625	78	3666.	1		1240	153	293.	1		1855	228	0.
1		0015	4	0.	1		0630	79	3597.	1		1245	154	265.	1		1900	229	0.
1		0020	5	0.	1		0635	80	3528.	1		1250	155	238.	1		1905	230	0.
1		0025	6	0.	1		0640	81	3458.	1		1255	156	209.	1		1910	231	0.
1		0030	7	0.	1		0645	82	3389.	1		1300	157	177.	1		1915	232	0.
1		0035	8	0.	1		0650	83	3319.	1		1305	158	144.	1		1920	233	0.
1		0040	9	0.	1		0655	84	3251.	1		1310	159	114.	1		1925	234	0.
1		0045	10	0.	1		0700	85	3184.	1		1315	160	90.	1		1930	235	0.
1		0050	11	0.	1		0705	86	3117.	1		1320	161	71.	1		1935	236	0.
1		0055	12	0.	1		0710	87	3053.	1		1325	162	56.	1		1940	237	0.
1		0100	13	0.	1		0715	88	2990.	1		1330	163	45.	1		1945	238	0.
1		0105	14	0.	1		0720	89	2929.	1		1335	164	36.	1		1950	239	0.
1		0110	15	0.	1		0725	90	2870.	1		1340	165	29.	1		1955	240	0.
1		0115	16	0.	1		0730	91	2812.	1		1345	166	24.	1		2000	241	0.
1		0120	17	0.	1		0735	92	2755.	1		1350	167	20.	1		2005	242	0.
1		0125	18	0.	1		0740	93	2699.	1		1355	168	16.	1		2010	243	0.
1		0130	19	0.	1		0745	94	2643.	1		1400	169	14.	1		2015	244	0.

1	0135	20	0.	*	1	0750	95	2588.	*	1	1405	170	12.	*	1	2020	245	0.
1	0140	21	0.	*	1	0755	96	2534.	*	1	1410	171	10.	*	1	2025	246	0.
1	0145	22	1.	*	1	0800	97	2481.	*	1	1415	172	8.	*	1	2030	247	0.
1	0150	23	2.	*	1	0805	98	2431.	*	1	1420	173	7.	*	1	2035	248	0.
1	0155	24	3.	*	1	0810	99	2383.	*	1	1425	174	6.	*	1	2040	249	0.
1	0200	25	6.	*	1	0815	100	2337.	*	1	1430	175	5.	*	1	2045	250	0.
1	0205	26	9.	*	1	0820	101	2292.	*	1	1435	176	5.	*	1	2050	251	0.
1	0210	27	15.	*	1	0825	102	2249.	*	1	1440	177	4.	*	1	2055	252	0.
1	0215	28	21.	*	1	0830	103	2206.	*	1	1445	178	4.	*	1	2100	253	0.
1	0220	29	29.	*	1	0835	104	2164.	*	1	1450	179	3.	*	1	2105	254	0.
1	0225	30	39.	*	1	0840	105	2121.	*	1	1455	180	3.	*	1	2110	255	0.
1	0230	31	49.	*	1	0845	106	2078.	*	1	1500	181	2.	*	1	2115	256	0.
1	0235	32	61.	*	1	0850	107	2035.	*	1	1505	182	2.	*	1	2120	257	0.
1	0240	33	72.	*	1	0855	108	1993.	*	1	1510	183	2.	*	1	2125	258	0.
1	0245	34	83.	*	1	0900	109	1952.	*	1	1515	184	2.	*	1	2130	259	0.
1	0250	35	93.	*	1	0905	110	1912.	*	1	1520	185	2.	*	1	2135	260	0.
1	0255	36	103.	*	1	0910	111	1872.	*	1	1525	186	1.	*	1	2140	261	0.
1	0300	37	114.	*	1	0915	112	1833.	*	1	1530	187	1.	*	1	2145	262	0.
1	0305	38	127.	*	1	0920	113	1793.	*	1	1535	188	1.	*	1	2150	263	0.
1	0310	39	146.	*	1	0925	114	1752.	*	1	1540	189	1.	*	1	2155	264	0.
1	0315	40	172.	*	1	0930	115	1712.	*	1	1545	190	1.	*	1	2200	265	0.
1	0320	41	211.	*	1	0935	116	1672.	*	1	1550	191	1.	*	1	2205	266	0.
1	0325	42	268.	*	1	0940	117	1634.	*	1	1555	192	1.	*	1	2210	267	0.
1	0330	43	356.	*	1	0945	118	1596.	*	1	1600	193	1.	*	1	2215	268	0.
1	0335	44	493.	*	1	0950	119	1557.	*	1	1605	194	1.	*	1	2220	269	0.
1	0340	45	682.	*	1	0955	120	1518.	*	1	1610	195	1.	*	1	2225	270	0.
1	0345	46	923.	*	1	1000	121	1478.	*	1	1615	196	0.	*	1	2230	271	0.
1	0350	47	1208.	*	1	1005	122	1438.	*	1	1620	197	0.	*	1	2235	272	0.
1	0355	48	1521.	*	1	1010	123	1399.	*	1	1625	198	0.	*	1	2240	273	0.
1	0400	49	1834.	*	1	1015	124	1361.	*	1	1630	199	0.	*	1	2245	274	0.
1	0405	50	2119.	*	1	1020	125	1323.	*	1	1635	200	0.	*	1	2250	275	0.
1	0410	51	2360.	*	1	1025	126	1285.	*	1	1640	201	0.	*	1	2255	276	0.
1	0415	52	2550.	*	1	1030	127	1246.	*	1	1645	202	0.	*	1	2300	277	0.
1	0420	53	2701.	*	1	1035	128	1206.	*	1	1650	203	0.	*	1	2305	278	0.
1	0425	54	2822.	*	1	1040	129	1166.	*	1	1655	204	0.	*	1	2310	279	0.
1	0430	55	2901.	*	1	1045	130	1128.	*	1	1700	205	0.	*	1	2315	280	0.
1	0435	56	2955.	*	1	1050	131	1090.	*	1	1705	206	0.	*	1	2320	281	0.
1	0440	57	3018.	*	1	1055	132	1053.	*	1	1710	207	0.	*	1	2325	282	0.
1	0445	58	3115.	*	1	1100	133	1015.	*	1	1715	208	0.	*	1	2330	283	0.
1	0450	59	3243.	*	1	1105	134	976.	*	1	1720	209	0.	*	1	2335	284	0.
1	0455	60	3401.	*	1	1110	135	937.	*	1	1725	210	0.	*	1	2340	285	0.
1	0500	61	3570.	*	1	1115	136	898.	*	1	1730	211	0.	*	1	2345	286	0.
1	0505	62	3738.	*	1	1120	137	861.	*	1	1735	212	0.	*	1	2350	287	0.
1	0510	63	3898.	*	1	1125	138	826.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	4044.	*	1	1130	139	790.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	4159.	*	1	1135	140	754.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	4239.	*	1	1140	141	717.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	4280.	*	1	1145	142	678.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	4288.	*	1	1150	143	640.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	4269.	*	1	1155	144	604.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	4226.	*	1	1200	145	569.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	4169.	*	1	1205	146	536.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	4100.	*	1	1210	147	503.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	4023.	*	1	1215	148	468.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	3945.	*	1	1220	149	430.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	3869.	*	1	1225	150	392.	*	1	1840	225	0.	*	2	0055	300	0.
				*					*					*				

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PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)				
		(CFS)			
+ 4288.	5.58	2880.	849.	818.	818.
		(INCHES) .301	.355	.355	.355
		(AC-FT) 1428.	1684.	1684.	1684.

CUMULATIVE AREA = 88.86 SQ MI

COMPUTED MUSKINGUM-CUNGE PARAMETERS

ELEMENT	ALPHA	M	COMPUTATION TIME STEP DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	.08	1.64	4.42	750.00	2481.76	340.21	.19	5.66

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

MAIN .08 1.64 5.00 2481.49 340.00 .19

CONTINUITY SUMMARY (AC-FT) - INFLOW= .8861E+03 EXCESS= .0000E+00 OUTFLOW= .8862E+03 BASIN STORAGE= .1055E-01 PERCENT ERROR= .0

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HYDROGRAPH AT STATION FINISH
PLAN 1, RATIO = .44

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DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	2281.	1		1230	151	40.	1		1845	226	0.
1		0005	2	0.	1		0620	77	2253.	1		1235	152	37.	1		1850	227	0.
1		0010	3	0.	1		0625	78	2226.	1		1240	153	34.	1		1855	228	0.
1		0015	4	0.	1		0630	79	2197.	1		1245	154	32.	1		1900	229	0.
1		0020	5	0.	1		0635	80	2166.	1		1250	155	30.	1		1905	230	0.
1		0025	6	0.	1		0640	81	2133.	1		1255	156	28.	1		1910	231	0.
1		0030	7	0.	1		0645	82	2097.	1		1300	157	26.	1		1915	232	0.
1		0035	8	0.	1		0650	83	2060.	1		1305	158	24.	1		1920	233	0.
1		0040	9	0.	1		0655	84	2023.	1		1310	159	23.	1		1925	234	0.
1		0045	10	0.	1		0700	85	1984.	1		1315	160	21.	1		1930	235	0.
1		0050	11	0.	1		0705	86	1946.	1		1320	161	20.	1		1935	236	0.
1		0055	12	0.	1		0710	87	1906.	1		1325	162	18.	1		1940	237	0.
1		0100	13	0.	1		0715	88	1867.	1		1330	163	17.	1		1945	238	0.
1		0105	14	0.	1		0720	89	1828.	1		1335	164	16.	1		1950	239	0.
1		0110	15	0.	1		0725	90	1788.	1		1340	165	15.	1		1955	240	0.
1		0115	16	0.	1		0730	91	1749.	1		1345	166	14.	1		2000	241	0.
1		0120	17	0.	1		0735	92	1709.	1		1350	167	13.	1		2005	242	0.
1		0125	18	0.	1		0740	93	1670.	1		1355	168	12.	1		2010	243	0.
1		0130	19	0.	1		0745	94	1630.	1		1400	169	11.	1		2015	244	0.
1		0135	20	0.	1		0750	95	1591.	1		1405	170	10.	1		2020	245	0.
1		0140	21	0.	1		0755	96	1552.	1		1410	171	9.	1		2025	246	0.
1		0145	22	0.	1		0800	97	1515.	1		1415	172	9.	1		2030	247	0.
1		0150	23	0.	1		0805	98	1478.	1		1420	173	8.	1		2035	248	0.
1		0155	24	0.	1		0810	99	1441.	1		1425	174	7.	1		2040	249	0.
1		0200	25	0.	1		0815	100	1403.	1		1430	175	7.	1		2045	250	0.
1		0205	26	0.	1		0820	101	1365.	1		1435	176	6.	1		2050	251	0.
1		0210	27	0.	1		0825	102	1328.	1		1440	177	6.	1		2055	252	0.
1		0215	28	0.	1		0830	103	1291.	1		1445	178	5.	1		2100	253	0.
1		0220	29	1.	1		0835	104	1255.	1		1450	179	5.	1		2105	254	0.
1		0225	30	1.	1		0840	105	1220.	1		1455	180	5.	1		2110	255	0.
1		0230	31	2.	1		0845	106	1185.	1		1500	181	4.	1		2115	256	0.
1		0235	32	3.	1		0850	107	1152.	1		1505	182	4.	1		2120	257	0.
1		0240	33	5.	1		0855	108	1118.	1		1510	183	4.	1		2125	258	0.
1		0245	34	6.	1		0900	109	1084.	1		1515	184	3.	1		2130	259	0.
1		0250	35	8.	1		0905	110	1049.	1		1520	185	3.	1		2135	260	0.
1		0255	36	11.	1		0910	111	1012.	1		1525	186	3.	1		2140	261	0.
1		0300	37	14.	1		0915	112	977.	1		1530	187	3.	1		2145	262	0.
1		0305	38	18.	1		0920	113	942.	1		1535	188	3.	1		2150	263	0.
1		0310	39	23.	1		0925	114	909.	1		1540	189	2.	1		2155	264	0.
1		0315	40	32.	1		0930	115	877.	1		1545	190	2.	1		2200	265	0.
1		0320	41	45.	1		0935	116	846.	1		1550	191	2.	1		2205	266	0.
1		0325	42	66.	1		0940	117	815.	1		1555	192	2.	1		2210	267	0.
1		0330	43	98.	1		0945	118	783.	1		1600	193	2.	1		2215	268	0.
1		0335	44	146.	1		0950	119	749.	1		1605	194	2.	1		2220	269	0.
1		0340	45	223.	1		0955	120	714.	1		1610	195	1.	1		2225	270	0.
1		0345	46	335.	1		1000	121	679.	1		1615	196	1.	1		2230	271	0.
1		0350	47	473.	1		1005	122	646.	1		1620	197	1.	1		2235	272	0.
1		0355	48	635.	1		1010	123	615.	1		1625	198	1.	1		2240	273	0.
1		0400	49	811.	1		1015	124	585.	1		1630	199	1.	1		2245	274	0.
1		0405	50	975.	1		1020	125	557.	1		1635	200	1.	1		2250	275	0.
1		0410	51	1116.	1		1025	126	528.	1		1640	201	1.	1		2255	276	0.
1		0415	52	1234.	1		1030	127	497.	1		1645	202	1.	1		2300	277	0.
1		0420	53	1331.	1		1035	128	465.	1		1650	203	1.	1		2305	278	0.
1		0425	54	1409.	1		1040	129	430.	1		1655	204	1.	1		2310	279	0.
1		0430	55	1463.	1		1045	130	395.	1		1700	205	1.	1		2315	280	0.
1		0435	56	1493.	1		1050	131	364.	1		1705	206	1.	1		2320	281	0.
1		0440	57	1510.	1		1055	132	335.	1		1710	207	1.	1		2325	282	0.
1		0445	58	1529.	1		1100	133	310.	1		1715	208	1.	1		2330	283	0.
1		0450	59	1554.	1		1105	134	286.	1		1720	209	0.	1		2335	284	0.
1		0455	60	1599.	1		1110	135	264.	1		1725	210	0.	1		2340	285	0.
1		0500	61	1677.	1		1115	136	244.	1		1730	211	0.	1		2345	286	0.
1		0505	62	1807.	1		1120	137	223.	1		1735	212	0.	1		2350	287	0.
1		0510	63	1982.	1		1125	138	203.	1		1740	213	0.	1		2355	288	0.
1		0515	64	2153.	1		1130	139	180.	1		1745	214	0.	2		0000	289	0.
1		0520	65	2282.	1		1135	140	156.	1		1750	215	0.	2		0005	290	0.

1	0525	66	2374.	*	1	1140	141	133.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	2436.	*	1	1145	142	113.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	2471.	*	1	1150	143	97.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	2481.	*	1	1155	144	84.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	2471.	*	1	1200	145	73.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	2448.	*	1	1205	146	65.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	2417.	*	1	1210	147	58.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	2382.	*	1	1215	148	53.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	2347.	*	1	1220	149	48.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	2313.	*	1	1225	150	44.	*	1	1840	225	0.	*	2	0055	300	0.
				*					*					*				

****

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)				
		(CFS)			
+ 2481.	5.67	1628.	447.	430.	430.
		(INCHES) .170	.187	.187	.187
		(AC-FT) 807.	886.	886.	886.

CUMULATIVE AREA = 88.86 SQ MI

COMPUTED MUSKINGUM-CUNGE PARAMETERS

ELEMENT	ALPHA	M	COMPUTATION TIME STEP DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	.08	1.64	5.00	500.00	469.02	430.00	.03	2.95
			INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL					
MAIN	.08	1.64	5.00		469.02	430.00	.03	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1643E+03 EXCESS= .0000E+00 OUTFLOW= .1644E+03 BASIN STORAGE= .1007E-01 PERCENT ERROR= .0

****

HYDROGRAPH AT STATION FINISH
PLAN 1, RATIO = .26

****

DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	*	1		0615	76	322.	*	1		1230	151	25.	*	1		1845	226	0.
1		0005	2	0.	*	1		0620	77	316.	*	1		1235	152	24.	*	1		1850	227	0.
1		0010	3	0.	*	1		0625	78	328.	*	1		1240	153	22.	*	1		1855	228	0.
1		0015	4	0.	*	1		0630	79	372.	*	1		1245	154	21.	*	1		1900	229	0.
1		0020	5	0.	*	1		0635	80	425.	*	1		1250	155	20.	*	1		1905	230	0.
1		0025	6	0.	*	1		0640	81	433.	*	1		1255	156	19.	*	1		1910	231	0.
1		0030	7	0.	*	1		0645	82	414.	*	1		1300	157	17.	*	1		1915	232	0.
1		0035	8	0.	*	1		0650	83	428.	*	1		1305	158	16.	*	1		1920	233	0.
1		0040	9	0.	*	1		0655	84	450.	*	1		1310	159	16.	*	1		1925	234	0.
1		0045	10	0.	*	1		0700	85	447.	*	1		1315	160	15.	*	1		1930	235	0.
1		0050	11	0.	*	1		0705	86	456.	*	1		1320	161	14.	*	1		1935	236	0.
1		0055	12	0.	*	1		0710	87	469.	*	1		1325	162	13.	*	1		1940	237	0.
1		0100	13	0.	*	1		0715	88	463.	*	1		1330	163	12.	*	1		1945	238	0.
1		0105	14	0.	*	1		0720	89	463.	*	1		1335	164	12.	*	1		1950	239	0.
1		0110	15	0.	*	1		0725	90	459.	*	1		1340	165	11.	*	1		1955	240	0.
1		0115	16	0.	*	1		0730	91	449.	*	1		1345	166	10.	*	1		2000	241	0.
1		0120	17	0.	*	1		0735	92	443.	*	1		1350	167	10.	*	1		2005	242	0.
1		0125	18	0.	*	1		0740	93	431.	*	1		1355	168	9.	*	1		2010	243	0.
1		0130	19	0.	*	1		0745	94	419.	*	1		1400	169	9.	*	1		2015	244	0.
1		0135	20	0.	*	1		0750	95	408.	*	1		1405	170	8.	*	1		2020	245	0.
1		0140	21	0.	*	1		0755	96	394.	*	1		1410	171	8.	*	1		2025	246	0.
1		0145	22	0.	*	1		0800	97	380.	*	1		1415	172	7.	*	1		2030	247	0.
1		0150	23	0.	*	1		0805	98	366.	*	1		1420	173	7.	*	1		2035	248	0.
1		0155	24	0.	*	1		0810	99	353.	*	1		1425	174	7.	*	1		2040	249	0.
1		0200	25	0.	*	1		0815	100	339.	*	1		1430	175	6.	*	1		2045	250	0.
1		0205	26	0.	*	1		0820	101	327.	*	1		1435	176	6.	*	1		2050	251	0.
1		0210	27	0.	*	1		0825	102	313.	*	1		1440	177	6.	*	1		2055	252	0.
1		0215	28	0.	*	1		0830	103	301.	*	1		1445	178	5.	*	1		2100	253	0.
1		0220	29	0.	*	1		0835	104	289.	*	1		1450	179	5.	*	1		2105	254	0.
1		0225	30	0.	*	1		0840	105	277.	*	1		1455	180	5.	*	1		2110	255	0.

1	0230	31	0.	*	1	0845	106	265.	*	1	1500	181	5.	*	1	2115	256	0.
1	0235	32	0.	*	1	0850	107	253.	*	1	1505	182	4.	*	1	2120	257	0.
1	0240	33	0.	*	1	0855	108	242.	*	1	1510	183	4.	*	1	2125	258	0.
1	0245	34	0.	*	1	0900	109	230.	*	1	1515	184	4.	*	1	2130	259	0.
1	0250	35	0.	*	1	0905	110	218.	*	1	1520	185	4.	*	1	2135	260	0.
1	0255	36	0.	*	1	0910	111	205.	*	1	1525	186	4.	*	1	2140	261	0.
1	0300	37	0.	*	1	0915	112	191.	*	1	1530	187	4.	*	1	2145	262	0.
1	0305	38	0.	*	1	0920	113	175.	*	1	1535	188	3.	*	1	2150	263	0.
1	0310	39	0.	*	1	0925	114	161.	*	1	1540	189	3.	*	1	2155	264	0.
1	0315	40	0.	*	1	0930	115	149.	*	1	1545	190	3.	*	1	2200	265	0.
1	0320	41	0.	*	1	0935	116	140.	*	1	1550	191	3.	*	1	2205	266	0.
1	0325	42	0.	*	1	0940	117	132.	*	1	1555	192	3.	*	1	2210	267	0.
1	0330	43	0.	*	1	0945	118	123.	*	1	1600	193	3.	*	1	2215	268	0.
1	0335	44	0.	*	1	0950	119	115.	*	1	1605	194	3.	*	1	2220	269	0.
1	0340	45	2.	*	1	0955	120	109.	*	1	1610	195	3.	*	1	2225	270	0.
1	0345	46	5.	*	1	1000	121	104.	*	1	1615	196	2.	*	1	2230	271	0.
1	0350	47	12.	*	1	1005	122	100.	*	1	1620	197	2.	*	1	2235	272	0.
1	0355	48	23.	*	1	1010	123	96.	*	1	1625	198	2.	*	1	2240	273	0.
1	0400	49	39.	*	1	1015	124	92.	*	1	1630	199	2.	*	1	2245	274	0.
1	0405	50	64.	*	1	1020	125	88.	*	1	1635	200	2.	*	1	2250	275	0.
1	0410	51	97.	*	1	1025	126	84.	*	1	1640	201	2.	*	1	2255	276	0.
1	0415	52	127.	*	1	1030	127	80.	*	1	1645	202	2.	*	1	2300	277	0.
1	0420	53	153.	*	1	1035	128	77.	*	1	1650	203	2.	*	1	2305	278	0.
1	0425	54	176.	*	1	1040	129	74.	*	1	1655	204	2.	*	1	2310	279	0.
1	0430	55	194.	*	1	1045	130	70.	*	1	1700	205	1.	*	1	2315	280	0.
1	0435	56	208.	*	1	1050	131	67.	*	1	1705	206	1.	*	1	2320	281	0.
1	0440	57	218.	*	1	1055	132	64.	*	1	1710	207	1.	*	1	2325	282	0.
1	0445	58	225.	*	1	1100	133	61.	*	1	1715	208	1.	*	1	2330	283	0.
1	0450	59	231.	*	1	1105	134	58.	*	1	1720	209	1.	*	1	2335	284	0.
1	0455	60	237.	*	1	1110	135	56.	*	1	1725	210	1.	*	1	2340	285	0.
1	0500	61	247.	*	1	1115	136	53.	*	1	1730	211	1.	*	1	2345	286	0.
1	0505	62	263.	*	1	1120	137	51.	*	1	1735	212	1.	*	1	2350	287	0.
1	0510	63	286.	*	1	1125	138	49.	*	1	1740	213	1.	*	1	2355	288	0.
1	0515	64	314.	*	1	1130	139	47.	*	1	1745	214	1.	*	2	0000	289	0.
1	0520	65	342.	*	1	1135	140	45.	*	1	1750	215	1.	*	2	0005	290	0.
1	0525	66	364.	*	1	1140	141	43.	*	1	1755	216	1.	*	2	0010	291	0.
1	0530	67	380.	*	1	1145	142	40.	*	1	1800	217	1.	*	2	0015	292	0.
1	0535	68	390.	*	1	1150	143	39.	*	1	1805	218	1.	*	2	0020	293	0.
1	0540	69	395.	*	1	1155	144	37.	*	1	1810	219	1.	*	2	0025	294	0.
1	0545	70	396.	*	1	1200	145	35.	*	1	1815	220	1.	*	2	0030	295	0.
1	0550	71	390.	*	1	1205	146	33.	*	1	1820	221	1.	*	2	0035	296	0.
1	0555	72	379.	*	1	1210	147	31.	*	1	1825	222	1.	*	2	0040	297	0.
1	0600	73	364.	*	1	1215	148	29.	*	1	1830	223	1.	*	2	0045	298	0.
1	0605	74	350.	*	1	1220	149	28.	*	1	1835	224	1.	*	2	0050	299	0.
1	0610	75	335.	*	1	1225	150	26.	*	1	1840	225	1.	*	2	0055	300	0.

****

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 469.	7.17		301.	83.	80.	80.
		(INCHES)	.032	.035	.035	.035
		(AC-FT)	149.	164.	164.	164.

CUMULATIVE AREA = 88.86 SQ MI

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1****************************************                                                    ****************************************
 *                                      *                                                    *                                      *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *                                                    *    U.S. ARMY CORPS OF ENGINEERS      *
 *               JUN   1998             *                                                    *    HYDROLOGIC ENGINEERING CENTER     *
 *            VERSION 4.1               *                                                    *          609 SECOND STREET           *
 *                                      *                                                    *       DAVIS, CALIFORNIA 95616        *
 *  RUN DATE   18MAR08  TIME  15:00:52  *                                                    *           (916) 756-1104             *
 *                                      *                                                    *                                      *
 ****************************************                                                    ****************************************
```

```
X     X  XXXXXXX   XXXXX           X
X     X  X        X     X         XX
X     X  X        X                X
XXXXXXX  XXXX     X        XXXXX   X
X     X  X        X                X
X     X  X        X     X          X
X     X  XXXXXXX   XXXXX          XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM


```
          LINE           ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 *** FREE ***
 *** NOLIST ***
```


```
1****************************************                                                    ****************************************
 *                                      *                                                    *                                      *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *                                                    *    U.S. ARMY CORPS OF ENGINEERS      *
 *               JUN   1998             *                                                    *    HYDROLOGIC ENGINEERING CENTER     *
 *            VERSION 4.1               *                                                    *          609 SECOND STREET           *
 *                                      *                                                    *       DAVIS, CALIFORNIA 95616        *
 *  RUN DATE   18MAR08  TIME  15:00:52  *                                                    *           (916) 756-1104             *
 *                                      *                                                    *                                      *
 ****************************************                                                    ****************************************
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KLEINFELDER
FEBRUARY 2008
NO-ACTION ALTERNATIVE

DESIGN STORM = 100-YEAR 6-HOUR STORM
STORM DISTRIBUTION = SDN5

```
  10 IO          OUTPUT CONTROL VARIABLES
                       IPRNT           5  PRINT CONTROL
                       IPLOT           0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE

     IT          HYDROGRAPH TIME DATA
                        NMIN           5  MINUTES IN COMPUTATION INTERVAL
                       IDATE      1    0  STARTING DATE
                       ITIME        0000  STARTING TIME
                          NQ         300  NUMBER OF HYDROGRAPH ORDINATES
                      NDDATE      2    0  ENDING DATE
                      NDTIME        0055  ENDING TIME
                      ICENT           19  CENTURY MARK

                 COMPUTATION INTERVAL     .08 HOURS
                      TOTAL TIME BASE   24.92 HOURS

          ENGLISH UNITS
```

```
              DRAINAGE AREA         SQUARE MILES
              PRECIPITATION DEPTH   INCHES
              LENGTH, ELEVATION     FEET
              FLOW                  CUBIC FEET PER SECOND
              STORAGE VOLUME        ACRE-FEET
              SURFACE AREA          ACRES
              TEMPERATURE           DEGREES FAHRENHEIT

     JP          MULTI-PLAN OPTION
                       NPLAN           1  NUMBER OF PLANS

     JR          MULTI-RATIO OPTION
                     RATIOS OF PRECIPITATION
                   1.00       .87       .74       .57       .44       .26


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


            **************
            *            *
1250 KK     *     ULWIN  *
            *            *
            **************

1254 KO          OUTPUT CONTROL VARIABLES
                       IPRNT           1  PRINT CONTROL
                       IPLOT           0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE

1253 HC          HYDROGRAPH COMBINATION
                       ICOMP           4  NUMBER OF HYDROGRAPHS TO COMBINE

                                                                  ***
*****************************************************************************************************************************************

                                                HYDROGRAPH AT STATION    ULWIN
                                                     SUM OF  4 HYDROGRAPHS
                                                   PLAN 1,   RATIO =  1.00
*****************************************************************************************************************************************
```

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	7837.	1		1230	151	3.	1		1845	226	0.
1		0005	2	0.	1		0620	77	7134.	1		1235	152	3.	1		1850	227	0.
1		0010	3	0.	1		0625	78	6500.	1		1240	153	3.	1		1855	228	0.
1		0015	4	0.	1		0630	79	5937.	1		1245	154	2.	1		1900	229	0.
1		0020	5	0.	1		0635	80	5427.	1		1250	155	2.	1		1905	230	0.
1		0025	6	1.	1		0640	81	4973.	1		1255	156	2.	1		1910	231	0.
1		0030	7	4.	1		0645	82	4562.	1		1300	157	1.	1		1915	232	0.
1		0035	8	9.	1		0650	83	4188.	1		1305	158	1.	1		1920	233	0.
1		0040	9	15.	1		0655	84	3845.	1		1310	159	1.	1		1925	234	0.
1		0045	10	21.	1		0700	85	3526.	1		1315	160	1.	1		1930	235	0.
1		0050	11	27.	1		0705	86	3233.	1		1320	161	1.	1		1935	236	0.
1		0055	12	32.	1		0710	87	2961.	1		1325	162	1.	1		1940	237	0.
1		0100	13	36.	1		0715	88	2708.	1		1330	163	1.	1		1945	238	0.
1		0105	14	40.	1		0720	89	2474.	1		1335	164	0.	1		1950	239	0.
1		0110	15	43.	1		0725	90	2258.	1		1340	165	0.	1		1955	240	0.
1		0115	16	48.	1		0730	91	2059.	1		1345	166	0.	1		2000	241	0.
1		0120	17	54.	1		0735	92	1877.	1		1350	167	0.	1		2005	242	0.
1		0125	18	63.	1		0740	93	1710.	1		1355	168	0.	1		2010	243	0.
1		0130	19	78.	1		0745	94	1557.	1		1400	169	0.	1		2015	244	0.
1		0135	20	100.	1		0750	95	1418.	1		1405	170	0.	1		2020	245	0.
1		0140	21	130.	1		0755	96	1293.	1		1410	171	0.	1		2025	246	0.
1		0145	22	168.	1		0800	97	1179.	1		1415	172	0.	1		2030	247	0.
1		0150	23	212.	1		0805	98	1075.	1		1420	173	0.	1		2035	248	0.
1		0155	24	260.	1		0810	99	978.	1		1425	174	0.	1		2040	249	0.
1		0200	25	309.	1		0815	100	887.	1		1430	175	0.	1		2045	250	0.
1		0205	26	362.	1		0820	101	804.	1		1435	176	0.	1		2050	251	0.
1		0210	27	418.	1		0825	102	728.	1		1440	177	0.	1		2055	252	0.
1		0215	28	477.	1		0830	103	659.	1		1445	178	0.	1		2100	253	0.
1		0220	29	536.	1		0835	104	597.	1		1450	179	0.	1		2105	254	0.
1		0225	30	596.	1		0840	105	541.	1		1455	180	0.	1		2110	255	0.
1		0230	31	661.	1		0845	106	490.	1		1500	181	0.	1		2115	256	0.
1		0235	32	736.	1		0850	107	445.	1		1505	182	0.	1		2120	257	0.
1		0240	33	824.	1		0855	108	404.	1		1510	183	0.	1		2125	258	0.
1		0245	34	926.	1		0900	109	367.	1		1515	184	0.	1		2130	259	0.
1		0250	35	1039.	1		0905	110	333.	1		1520	185	0.	1		2135	260	0.

1	0255	36	1163.	*	1	0910	111	303.	*	1	1525	186	0.	*	1	2140	261	0.
1	0300	37	1295.	*	1	0915	112	275.	*	1	1530	187	0.	*	1	2145	262	0.
1	0305	38	1435.	*	1	0920	113	251.	*	1	1535	188	0.	*	1	2150	263	0.
1	0310	39	1583.	*	1	0925	114	228.	*	1	1540	189	0.	*	1	2155	264	0.
1	0315	40	1732.	*	1	0930	115	207.	*	1	1545	190	0.	*	1	2200	265	0.
1	0320	41	1891.	*	1	0935	116	188.	*	1	1550	191	0.	*	1	2205	266	0.
1	0325	42	2083.	*	1	0940	117	170.	*	1	1555	192	0.	*	1	2210	267	0.
1	0330	43	2344.	*	1	0945	118	154.	*	1	1600	193	0.	*	1	2215	268	0.
1	0335	44	2714.	*	1	0950	119	139.	*	1	1605	194	0.	*	1	2220	269	0.
1	0340	45	3232.	*	1	0955	120	125.	*	1	1610	195	0.	*	1	2225	270	0.
1	0345	46	3950.	*	1	1000	121	113.	*	1	1615	196	0.	*	1	2230	271	0.
1	0350	47	5031.	*	1	1005	122	101.	*	1	1620	197	0.	*	1	2235	272	0.
1	0355	48	6700.	*	1	1010	123	91.	*	1	1625	198	0.	*	1	2240	273	0.
1	0400	49	9058.	*	1	1015	124	82.	*	1	1630	199	0.	*	1	2245	274	0.
1	0405	50	11694.	*	1	1020	125	74.	*	1	1635	200	0.	*	1	2250	275	0.
1	0410	51	14021.	*	1	1025	126	66.	*	1	1640	201	0.	*	1	2255	276	0.
1	0415	52	15706.	*	1	1030	127	59.	*	1	1645	202	0.	*	1	2300	277	0.
1	0420	53	16749.	*	1	1035	128	53.	*	1	1650	203	0.	*	1	2305	278	0.
1	0425	54	17126.	*	1	1040	129	47.	*	1	1655	204	0.	*	1	2310	279	0.
1	0430	55	17097.	*	1	1045	130	42.	*	1	1700	205	0.	*	1	2315	280	0.
1	0435	56	16688.	*	1	1050	131	38.	*	1	1705	206	0.	*	1	2320	281	0.
1	0440	57	16030.	*	1	1055	132	34.	*	1	1710	207	0.	*	1	2325	282	0.
1	0445	58	15275.	*	1	1100	133	30.	*	1	1715	208	0.	*	1	2330	283	0.
1	0450	59	14484.	*	1	1105	134	27.	*	1	1720	209	0.	*	1	2335	284	0.
1	0455	60	13770.	*	1	1110	135	24.	*	1	1725	210	0.	*	1	2340	285	0.
1	0500	61	13221.	*	1	1115	136	21.	*	1	1730	211	0.	*	1	2345	286	0.
1	0505	62	12873.	*	1	1120	137	19.	*	1	1735	212	0.	*	1	2350	287	0.
1	0510	63	12715.	*	1	1125	138	17.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	12748.	*	1	1130	139	15.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	12874.	*	1	1135	140	13.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	13072.	*	1	1140	141	12.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	13226.	*	1	1145	142	11.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	13211.	*	1	1150	143	9.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	12951.	*	1	1155	144	8.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	12489.	*	1	1200	145	7.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	11836.	*	1	1205	146	7.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	11073.	*	1	1210	147	6.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	10249.	*	1	1215	148	5.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	9410.	*	1	1220	149	4.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	8600.	*	1	1225	150	4.	*	1	1840	225	0.	*	2	0055	300	0.

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 17126.	4.42		6677.	1707.	1644.	1644.
		(INCHES)	1.055	1.079	1.079	1.079
		(AC-FT)	3311.	3386.	3386.	3386.

CUMULATIVE AREA = 58.84 SQ MI

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HYDROGRAPH AT STATION ULWIN
SUM OF 4 HYDROGRAPHS
PLAN 1, RATIO = .87

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DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	6586.	1		1230	151	5.	1		1845	226	0.
1		0005	2	0.	1		0620	77	6013.	1		1235	152	5.	1		1850	227	0.
1		0010	3	0.	1		0625	78	5491.	1		1240	153	4.	1		1855	228	0.
1		0015	4	0.	1		0630	79	5016.	1		1245	154	4.	1		1900	229	0.
1		0020	5	0.	1		0635	80	4592.	1		1250	155	3.	1		1905	230	0.
1		0025	6	1.	1		0640	81	4217.	1		1255	156	3.	1		1910	231	0.
1		0030	7	2.	1		0645	82	3876.	1		1300	157	2.	1		1915	232	0.
1		0035	8	4.	1		0650	83	3562.	1		1305	158	2.	1		1920	233	0.
1		0040	9	7.	1		0655	84	3275.	1		1310	159	2.	1		1925	234	0.
1		0045	10	10.	1		0700	85	3012.	1		1315	160	2.	1		1930	235	0.
1		0050	11	13.	1		0705	86	2767.	1		1320	161	1.	1		1935	236	0.
1		0055	12	16.	1		0710	87	2542.	1		1325	162	1.	1		1940	237	0.
1		0100	13	19.	1		0715	88	2334.	1		1330	163	1.	1		1945	238	0.
1		0105	14	20.	1		0720	89	2140.	1		1335	164	1.	1		1950	239	0.
1		0110	15	22.	1		0725	90	1960.	1		1340	165	1.	1		1955	240	0.
1		0115	16	24.	1		0730	91	1795.	1		1345	166	1.	1		2000	241	0.
1		0120	17	26.	1		0735	92	1643.	1		1350	167	1.	1		2005	242	0.

1	0125	18	29.	*	1	0740	93	1503.	*	1	1355	168	1.	*	1	2010	243	0.
1	0130	19	35.	*	1	0745	94	1377.	*	1	1400	169	0.	*	1	2015	244	0.
1	0135	20	43.	*	1	0750	95	1261.	*	1	1405	170	0.	*	1	2020	245	0.
1	0140	21	55.	*	1	0755	96	1155.	*	1	1410	171	0.	*	1	2025	246	0.
1	0145	22	70.	*	1	0800	97	1059.	*	1	1415	172	0.	*	1	2030	247	0.
1	0150	23	90.	*	1	0805	98	971.	*	1	1420	173	0.	*	1	2035	248	0.
1	0155	24	113.	*	1	0810	99	889.	*	1	1425	174	0.	*	1	2040	249	0.
1	0200	25	140.	*	1	0815	100	814.	*	1	1430	175	0.	*	1	2045	250	0.
1	0205	26	171.	*	1	0820	101	745.	*	1	1435	176	0.	*	1	2050	251	0.
1	0210	27	204.	*	1	0825	102	679.	*	1	1440	177	0.	*	1	2055	252	0.
1	0215	28	238.	*	1	0830	103	618.	*	1	1445	178	0.	*	1	2100	253	0.
1	0220	29	273.	*	1	0835	104	562.	*	1	1450	179	0.	*	1	2105	254	0.
1	0225	30	310.	*	1	0840	105	511.	*	1	1455	180	0.	*	1	2110	255	0.
1	0230	31	348.	*	1	0845	106	465.	*	1	1500	181	0.	*	1	2115	256	0.
1	0235	32	389.	*	1	0850	107	422.	*	1	1505	182	0.	*	1	2120	257	0.
1	0240	33	436.	*	1	0855	108	384.	*	1	1510	183	0.	*	1	2125	258	0.
1	0245	34	490.	*	1	0900	109	349.	*	1	1515	184	0.	*	1	2130	259	0.
1	0250	35	555.	*	1	0905	110	318.	*	1	1520	185	0.	*	1	2135	260	0.
1	0255	36	631.	*	1	0910	111	290.	*	1	1525	186	0.	*	1	2140	261	0.
1	0300	37	719.	*	1	0915	112	264.	*	1	1530	187	0.	*	1	2145	262	0.
1	0305	38	818.	*	1	0920	113	241.	*	1	1535	188	0.	*	1	2150	263	0.
1	0310	39	932.	*	1	0925	114	220.	*	1	1540	189	0.	*	1	2155	264	0.
1	0315	40	1060.	*	1	0930	115	201.	*	1	1545	190	0.	*	1	2200	265	0.
1	0320	41	1198.	*	1	0935	116	184.	*	1	1550	191	0.	*	1	2205	266	0.
1	0325	42	1354.	*	1	0940	117	169.	*	1	1555	192	0.	*	1	2210	267	0.
1	0330	43	1549.	*	1	0945	118	155.	*	1	1600	193	0.	*	1	2215	268	0.
1	0335	44	1811.	*	1	0950	119	142.	*	1	1605	194	0.	*	1	2220	269	0.
1	0340	45	2160.	*	1	0955	120	130.	*	1	1610	195	0.	*	1	2225	270	0.
1	0345	46	2592.	*	1	1000	121	119.	*	1	1615	196	0.	*	1	2230	271	0.
1	0350	47	3138.	*	1	1005	122	109.	*	1	1620	197	0.	*	1	2235	272	0.
1	0355	48	3982.	*	1	1010	123	100.	*	1	1625	198	0.	*	1	2240	273	0.
1	0400	49	5434.	*	1	1015	124	91.	*	1	1630	199	0.	*	1	2245	274	0.
1	0405	50	7455.	*	1	1020	125	83.	*	1	1635	200	0.	*	1	2250	275	0.
1	0410	51	9612.	*	1	1025	126	76.	*	1	1640	201	0.	*	1	2255	276	0.
1	0415	52	11234.	*	1	1030	127	70.	*	1	1645	202	0.	*	1	2300	277	0.
1	0420	53	12255.	*	1	1035	128	63.	*	1	1650	203	0.	*	1	2305	278	0.
1	0425	54	12725.	*	1	1040	129	57.	*	1	1655	204	0.	*	1	2310	279	0.
1	0430	55	12797.	*	1	1045	130	52.	*	1	1700	205	0.	*	1	2315	280	0.
1	0435	56	12649.	*	1	1050	131	47.	*	1	1705	206	0.	*	1	2320	281	0.
1	0440	57	12343.	*	1	1055	132	43.	*	1	1710	207	0.	*	1	2325	282	0.
1	0445	58	11918.	*	1	1100	133	38.	*	1	1715	208	0.	*	1	2330	283	0.
1	0450	59	11422.	*	1	1105	134	34.	*	1	1720	209	0.	*	1	2335	284	0.
1	0455	60	10916.	*	1	1110	135	31.	*	1	1725	210	0.	*	1	2340	285	0.
1	0500	61	10471.	*	1	1115	136	28.	*	1	1730	211	0.	*	1	2345	286	0.
1	0505	62	10162.	*	1	1120	137	25.	*	1	1735	212	0.	*	1	2350	287	0.
1	0510	63	9988.	*	1	1125	138	22.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	9977.	*	1	1130	139	20.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	10081.	*	1	1135	140	18.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	10233.	*	1	1140	141	16.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	10401.	*	1	1145	142	14.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	10479.	*	1	1150	143	13.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	10382.	*	1	1155	144	12.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	10106.	*	1	1200	145	10.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	9658.	*	1	1205	146	9.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	9104.	*	1	1210	147	8.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	8493.	*	1	1215	148	7.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	7844.	*	1	1220	149	7.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	7201.	*	1	1225	150	6.	*	1	1840	225	0.	*	2	0055	300	0.

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PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
+ 12797.	4.50	(CFS)	5157.	1318.	1270.	1270.
		(INCHES)	.815	.833	.833	.833
		(AC-FT)	2557.	2614.	2614.	2614.

CUMULATIVE AREA = 58.84 SQ MI

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HYDROGRAPH AT STATION ULWIN
SUM OF 4 HYDROGRAPHS
PLAN 1, RATIO = .74

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DA MON HRMN	ORD	FLOW	*	DA MON HRMN	ORD	FLOW	*	DA MON HRMN	ORD	FLOW	*	DA MON HRMN	ORD	FLOW

1	0000	1	0.	*	1	0615	76	5297.	*	1	1230	151	6.	*	1	1845	226	0.
1	0005	2	0.	*	1	0620	77	4864.	*	1	1235	152	5.	*	1	1850	227	0.
1	0010	3	0.	*	1	0625	78	4457.	*	1	1240	153	5.	*	1	1855	228	0.
1	0015	4	0.	*	1	0630	79	4083.	*	1	1245	154	4.	*	1	1900	229	0.
1	0020	5	0.	*	1	0635	80	3746.	*	1	1250	155	4.	*	1	1905	230	0.
1	0025	6	0.	*	1	0640	81	3443.	*	1	1255	156	3.	*	1	1910	231	0.
1	0030	7	0.	*	1	0645	82	3167.	*	1	1300	157	3.	*	1	1915	232	0.
1	0035	8	1.	*	1	0650	83	2915.	*	1	1305	158	3.	*	1	1920	233	0.
1	0040	9	2.	*	1	0655	84	2686.	*	1	1310	159	2.	*	1	1925	234	0.
1	0045	10	4.	*	1	0700	85	2478.	*	1	1315	160	2.	*	1	1930	235	0.
1	0050	11	5.	*	1	0705	86	2286.	*	1	1320	161	2.	*	1	1935	236	0.
1	0055	12	7.	*	1	0710	87	2109.	*	1	1325	162	2.	*	1	1940	237	0.
1	0100	13	8.	*	1	0715	88	1944.	*	1	1330	163	1.	*	1	1945	238	0.
1	0105	14	9.	*	1	0720	89	1790.	*	1	1335	164	1.	*	1	1950	239	0.
1	0110	15	10.	*	1	0725	90	1649.	*	1	1340	165	1.	*	1	1955	240	0.
1	0115	16	11.	*	1	0730	91	1520.	*	1	1345	166	1.	*	1	2000	241	0.
1	0120	17	12.	*	1	0735	92	1399.	*	1	1350	167	1.	*	1	2005	242	0.
1	0125	18	14.	*	1	0740	93	1288.	*	1	1355	168	1.	*	1	2010	243	0.
1	0130	19	16.	*	1	0745	94	1185.	*	1	1400	169	1.	*	1	2015	244	0.
1	0135	20	19.	*	1	0750	95	1091.	*	1	1405	170	1.	*	1	2020	245	0.
1	0140	21	23.	*	1	0755	96	1004.	*	1	1410	171	0.	*	1	2025	246	0.
1	0145	22	29.	*	1	0800	97	922.	*	1	1415	172	0.	*	1	2030	247	0.
1	0150	23	35.	*	1	0805	98	846.	*	1	1420	173	0.	*	1	2035	248	0.
1	0155	24	43.	*	1	0810	99	775.	*	1	1425	174	0.	*	1	2040	249	0.
1	0200	25	52.	*	1	0815	100	711.	*	1	1430	175	0.	*	1	2045	250	0.
1	0205	26	63.	*	1	0820	101	653.	*	1	1435	176	0.	*	1	2050	251	0.
1	0210	27	76.	*	1	0825	102	600.	*	1	1440	177	0.	*	1	2055	252	0.
1	0215	28	90.	*	1	0830	103	551.	*	1	1445	178	0.	*	1	2100	253	0.
1	0220	29	106.	*	1	0835	104	506.	*	1	1450	179	0.	*	1	2105	254	0.
1	0225	30	123.	*	1	0840	105	463.	*	1	1455	180	0.	*	1	2110	255	0.
1	0230	31	140.	*	1	0845	106	424.	*	1	1500	181	0.	*	1	2115	256	0.
1	0235	32	160.	*	1	0850	107	387.	*	1	1505	182	0.	*	1	2120	257	0.
1	0240	33	181.	*	1	0855	108	353.	*	1	1510	183	0.	*	1	2125	258	0.
1	0245	34	207.	*	1	0900	109	322.	*	1	1515	184	0.	*	1	2130	259	0.
1	0250	35	238.	*	1	0905	110	294.	*	1	1520	185	0.	*	1	2135	260	0.
1	0255	36	277.	*	1	0910	111	269.	*	1	1525	186	0.	*	1	2140	261	0.
1	0300	37	325.	*	1	0915	112	246.	*	1	1530	187	0.	*	1	2145	262	0.
1	0305	38	384.	*	1	0920	113	225.	*	1	1535	188	0.	*	1	2150	263	0.
1	0310	39	456.	*	1	0925	114	206.	*	1	1540	189	0.	*	1	2155	264	0.
1	0315	40	541.	*	1	0930	115	189.	*	1	1545	190	0.	*	1	2200	265	0.
1	0320	41	639.	*	1	0935	116	173.	*	1	1550	191	0.	*	1	2205	266	0.
1	0325	42	756.	*	1	0940	117	159.	*	1	1555	192	0.	*	1	2210	267	0.
1	0330	43	896.	*	1	0945	118	146.	*	1	1600	193	0.	*	1	2215	268	0.
1	0335	44	1066.	*	1	0950	119	134.	*	1	1605	194	0.	*	1	2220	269	0.
1	0340	45	1285.	*	1	0955	120	123.	*	1	1610	195	0.	*	1	2225	270	0.
1	0345	46	1564.	*	1	1000	121	113.	*	1	1615	196	0.	*	1	2230	271	0.
1	0350	47	1890.	*	1	1005	122	104.	*	1	1620	197	0.	*	1	2235	272	0.
1	0355	48	2262.	*	1	1010	123	96.	*	1	1625	198	0.	*	1	2240	273	0.
1	0400	49	2792.	*	1	1015	124	88.	*	1	1630	199	0.	*	1	2245	274	0.
1	0405	50	3841.	*	1	1020	125	81.	*	1	1635	200	0.	*	1	2250	275	0.
1	0410	51	5466.	*	1	1025	126	74.	*	1	1640	201	0.	*	1	2255	276	0.
1	0415	52	7104.	*	1	1030	127	68.	*	1	1645	202	0.	*	1	2300	277	0.
1	0420	53	8281.	*	1	1035	128	62.	*	1	1650	203	0.	*	1	2305	278	0.
1	0425	54	8856.	*	1	1040	129	57.	*	1	1655	204	0.	*	1	2310	279	0.
1	0430	55	9022.	*	1	1045	130	52.	*	1	1700	205	0.	*	1	2315	280	0.
1	0435	56	8951.	*	1	1050	131	47.	*	1	1705	206	0.	*	1	2320	281	0.
1	0440	57	8750.	*	1	1055	132	43.	*	1	1710	207	0.	*	1	2325	282	0.
1	0445	58	8509.	*	1	1100	133	39.	*	1	1715	208	0.	*	1	2330	283	0.
1	0450	59	8263.	*	1	1105	134	35.	*	1	1720	209	0.	*	1	2335	284	0.
1	0455	60	8021.	*	1	1110	135	32.	*	1	1725	210	0.	*	1	2340	285	0.
1	0500	61	7784.	*	1	1115	136	29.	*	1	1730	211	0.	*	1	2345	286	0.
1	0505	62	7560.	*	1	1120	137	26.	*	1	1735	212	0.	*	1	2350	287	0.
1	0510	63	7384.	*	1	1125	138	23.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	7317.	*	1	1130	139	21.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	7360.	*	1	1135	140	19.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	7473.	*	1	1140	141	17.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	7616.	*	1	1145	142	15.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	7741.	*	1	1150	143	14.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	7772.	*	1	1155	144	13.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	7660.	*	1	1200	145	11.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	7416.	*	1	1205	146	10.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	7071.	*	1	1210	147	9.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	6661.	*	1	1215	148	8.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	6211.	*	1	1220	149	7.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	5750.	*	1	1225	150	7.	*	1	1840	225	0.	*	2	0055	300	0.

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PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.92-HR

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+   (CFS)       (HR)
                          (CFS)
+    9022.      4.50                3754.        958.        923.         923.
                        (INCHES)      .593        .606        .606         .606
                         (AC-FT)     1861.       1901.       1901.        1901.

                        CUMULATIVE AREA =   58.84 SQ MI
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HYDROGRAPH AT STATION ULWIN
SUM OF 4 HYDROGRAPHS
PLAN 1, RATIO = .57

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DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	3490.	1		1230	151	10.	1		1845	226	0.
1		0005	2	0.	1		0620	77	3256.	1		1235	152	9.	1		1850	227	0.
1		0010	3	0.	1		0625	78	3027.	1		1240	153	8.	1		1855	228	0.
1		0015	4	0.	1		0630	79	2806.	1		1245	154	7.	1		1900	229	0.
1		0020	5	0.	1		0635	80	2594.	1		1250	155	7.	1		1905	230	0.
1		0025	6	0.	1		0640	81	2394.	1		1255	156	6.	1		1910	231	0.
1		0030	7	0.	1		0645	82	2208.	1		1300	157	6.	1		1915	232	0.
1		0035	8	0.	1		0650	83	2038.	1		1305	158	5.	1		1920	233	0.
1		0040	9	0.	1		0655	84	1883.	1		1310	159	5.	1		1925	234	0.
1		0045	10	0.	1		0700	85	1742.	1		1315	160	4.	1		1930	235	0.
1		0050	11	1.	1		0705	86	1614.	1		1320	161	4.	1		1935	236	0.
1		0055	12	1.	1		0710	87	1496.	1		1325	162	4.	1		1940	237	0.
1		0100	13	1.	1		0715	88	1387.	1		1330	163	3.	1		1945	238	0.
1		0105	14	1.	1		0720	89	1286.	1		1335	164	3.	1		1950	239	0.
1		0110	15	2.	1		0725	90	1193.	1		1340	165	3.	1		1955	240	0.
1		0115	16	2.	1		0730	91	1105.	1		1345	166	2.	1		2000	241	0.
1		0120	17	3.	1		0735	92	1024.	1		1350	167	2.	1		2005	242	0.
1		0125	18	3.	1		0740	93	950.	1		1355	168	2.	1		2010	243	0.
1		0130	19	4.	1		0745	94	881.	1		1400	169	2.	1		2015	244	0.
1		0135	20	5.	1		0750	95	817.	1		1405	170	2.	1		2020	245	0.
1		0140	21	7.	1		0755	96	758.	1		1410	171	1.	1		2025	246	0.
1		0145	22	9.	1		0800	97	704.	1		1415	172	1.	1		2030	247	0.
1		0150	23	11.	1		0805	98	653.	1		1420	173	1.	1		2035	248	0.
1		0155	24	13.	1		0810	99	606.	1		1425	174	1.	1		2040	249	0.
1		0200	25	15.	1		0815	100	562.	1		1430	175	1.	1		2045	250	0.
1		0205	26	18.	1		0820	101	522.	1		1435	176	1.	1		2050	251	0.
1		0210	27	21.	1		0825	102	484.	1		1440	177	1.	1		2055	252	0.
1		0215	28	24.	1		0830	103	448.	1		1445	178	1.	1		2100	253	0.
1		0220	29	26.	1		0835	104	415.	1		1450	179	1.	1		2105	254	0.
1		0225	30	28.	1		0840	105	385.	1		1455	180	0.	1		2110	255	0.
1		0230	31	30.	1		0845	106	357.	1		1500	181	0.	1		2115	256	0.
1		0235	32	32.	1		0850	107	331.	1		1505	182	0.	1		2120	257	0.
1		0240	33	35.	1		0855	108	306.	1		1510	183	0.	1		2125	258	0.
1		0245	34	39.	1		0900	109	284.	1		1515	184	0.	1		2130	259	0.
1		0250	35	44.	1		0905	110	262.	1		1520	185	0.	1		2135	260	0.
1		0255	36	52.	1		0910	111	242.	1		1525	186	0.	1		2140	261	0.
1		0300	37	63.	1		0915	112	224.	1		1530	187	0.	1		2145	262	0.
1		0305	38	80.	1		0920	113	206.	1		1535	188	0.	1		2150	263	0.
1		0310	39	102.	1		0925	114	190.	1		1540	189	0.	1		2155	264	0.
1		0315	40	133.	1		0930	115	175.	1		1545	190	0.	1		2200	265	0.
1		0320	41	172.	1		0935	116	161.	1		1550	191	0.	1		2205	266	0.
1		0325	42	223.	1		0940	117	149.	1		1555	192	0.	1		2210	267	0.
1		0330	43	290.	1		0945	118	137.	1		1600	193	0.	1		2215	268	0.
1		0335	44	374.	1		0950	119	127.	1		1605	194	0.	1		2220	269	0.
1		0340	45	474.	1		0955	120	117.	1		1610	195	0.	1		2225	270	0.
1		0345	46	578.	1		1000	121	108.	1		1615	196	0.	1		2230	271	0.
1		0350	47	681.	1		1005	122	100.	1		1620	197	0.	1		2235	272	0.
1		0355	48	841.	1		1010	123	92.	1		1625	198	0.	1		2240	273	0.
1		0400	49	1045.	1		1015	124	86.	1		1630	199	0.	1		2245	274	0.
1		0405	50	1232.	1		1020	125	79.	1		1635	200	0.	1		2250	275	0.
1		0410	51	1415.	1		1025	126	74.	1		1640	201	0.	1		2255	276	0.
1		0415	52	1856.	1		1030	127	69.	1		1645	202	0.	1		2300	277	0.
1		0420	53	2878.	1		1035	128	64.	1		1650	203	0.	1		2305	278	0.
1		0425	54	4051.	1		1040	129	59.	1		1655	204	0.	1		2310	279	0.
1		0430	55	4712.	1		1045	130	55.	1		1700	205	0.	1		2315	280	0.
1		0435	56	4943.	1		1050	131	52.	1		1705	206	0.	1		2320	281	0.
1		0440	57	4976.	1		1055	132	48.	1		1710	207	0.	1		2325	282	0.
1		0445	58	4886.	1		1100	133	45.	1		1715	208	0.	1		2330	283	0.
1		0450	59	4736.	1		1105	134	42.	1		1720	209	0.	1		2335	284	0.
1		0455	60	4568.	1		1110	135	39.	1		1725	210	0.	1		2340	285	0.
1		0500	61	4412.	1		1115	136	36.	1		1730	211	0.	1		2345	286	0.
1		0505	62	4282.	1		1120	137	34.	1		1735	212	0.	1		2350	287	0.

1	0510	63	4190.	*	1	1125	138	31.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	4149.	*	1	1130	139	29.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	4156.	*	1	1135	140	26.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	4193.	*	1	1140	141	24.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	4246.	*	1	1145	142	22.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	4321.	*	1	1150	143	20.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	4418.	*	1	1155	144	19.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	4498.	*	1	1200	145	17.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	4492.	*	1	1205	146	15.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	4373.	*	1	1210	147	14.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	4184.	*	1	1215	148	13.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	3965.	*	1	1220	149	12.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	3730.	*	1	1225	150	11.	*	1	1840	225	0.	*	2	0055	300	0.

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PEAK FLOW (CFS)	TIME (HR)	MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
+		(CFS)			
+ 4976.	4.67	2129.	544.	524.	524.
		(INCHES) .336	.344	.344	.344
		(AC-FT) 1056.	1080.	1080.	1080.

CUMULATIVE AREA = 58.84 SQ MI

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HYDROGRAPH AT STATION ULWIN
SUM OF 4 HYDROGRAPHS
PLAN 1, RATIO = .44

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DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	2038.	1		1230	151	13.	1		1845	226	0.
1		0005	2	0.	1		0620	77	1924.	1		1235	152	12.	1		1850	227	0.
1		0010	3	0.	1		0625	78	1797.	1		1240	153	12.	1		1855	228	0.
1		0015	4	0.	1		0630	79	1673.	1		1245	154	11.	1		1900	229	0.
1		0020	5	0.	1		0635	80	1574.	1		1250	155	10.	1		1905	230	0.
1		0025	6	0.	1		0640	81	1490.	1		1255	156	9.	1		1910	231	0.
1		0030	7	0.	1		0645	82	1400.	1		1300	157	8.	1		1915	232	0.
1		0035	8	0.	1		0650	83	1308.	1		1305	158	8.	1		1920	233	0.
1		0040	9	0.	1		0655	84	1227.	1		1310	159	7.	1		1925	234	0.
1		0045	10	0.	1		0700	85	1147.	1		1315	160	7.	1		1930	235	0.
1		0050	11	0.	1		0705	86	1061.	1		1320	161	6.	1		1935	236	0.
1		0055	12	0.	1		0710	87	983.	1		1325	162	6.	1		1940	237	0.
1		0100	13	0.	1		0715	88	918.	1		1330	163	5.	1		1945	238	0.
1		0105	14	0.	1		0720	89	854.	1		1335	164	5.	1		1950	239	0.
1		0110	15	0.	1		0725	90	794.	1		1340	165	5.	1		1955	240	0.
1		0115	16	0.	1		0730	91	744.	1		1345	166	4.	1		2000	241	0.
1		0120	17	0.	1		0735	92	695.	1		1350	167	4.	1		2005	242	0.
1		0125	18	0.	1		0740	93	649.	1		1355	168	4.	1		2010	243	0.
1		0130	19	1.	1		0745	94	609.	1		1400	169	3.	1		2015	244	0.
1		0135	20	1.	1		0750	95	569.	1		1405	170	3.	1		2020	245	0.
1		0140	21	1.	1		0755	96	531.	1		1410	171	3.	1		2025	246	0.
1		0145	22	1.	1		0800	97	499.	1		1415	172	3.	1		2030	247	0.
1		0150	23	2.	1		0805	98	466.	1		1420	173	2.	1		2035	248	0.
1		0155	24	3.	1		0810	99	436.	1		1425	174	2.	1		2040	249	0.
1		0200	25	4.	1		0815	100	409.	1		1430	175	2.	1		2045	250	0.
1		0205	26	5.	1		0820	101	382.	1		1435	176	2.	1		2050	251	0.
1		0210	27	6.	1		0825	102	359.	1		1440	177	2.	1		2055	252	0.
1		0215	28	7.	1		0830	103	336.	1		1445	178	2.	1		2100	253	0.
1		0220	29	8.	1		0835	104	315.	1		1450	179	2.	1		2105	254	0.
1		0225	30	9.	1		0840	105	296.	1		1455	180	1.	1		2110	255	0.
1		0230	31	9.	1		0845	106	277.	1		1500	181	1.	1		2115	256	0.
1		0235	32	9.	1		0850	107	260.	1		1505	182	1.	1		2120	257	0.
1		0240	33	9.	1		0855	108	244.	1		1510	183	1.	1		2125	258	0.
1		0245	34	9.	1		0900	109	229.	1		1515	184	1.	1		2130	259	0.
1		0250	35	10.	1		0905	110	215.	1		1520	185	1.	1		2135	260	0.
1		0255	36	12.	1		0910	111	202.	1		1525	186	1.	1		2140	261	0.
1		0300	37	15.	1		0915	112	189.	1		1530	187	1.	1		2145	262	0.
1		0305	38	19.	1		0920	113	177.	1		1535	188	1.	1		2150	263	0.
1		0310	39	26.	1		0925	114	165.	1		1540	189	1.	1		2155	264	0.
1		0315	40	35.	1		0930	115	154.	1		1545	190	1.	1		2200	265	0.
1		0320	41	48.	1		0935	116	144.	1		1550	191	1.	1		2205	266	0.
1		0325	42	66.	1		0940	117	134.	1		1555	192	1.	1		2210	267	0.
1		0330	43	93.	1		0945	118	125.	1		1600	193	0.	1		2215	268	0.
1		0335	44	128.	1		0950	119	116.	1		1605	194	0.	1		2220	269	0.

1	0340	45	171.	*	1	0955	120	109.	*	1	1610	195	0.	*	1	2225	270	0.
1	0345	46	216.	*	1	1000	121	101.	*	1	1615	196	0.	*	1	2230	271	0.
1	0350	47	258.	*	1	1005	122	95.	*	1	1620	197	0.	*	1	2235	272	0.
1	0355	48	297.	*	1	1010	123	88.	*	1	1625	198	0.	*	1	2240	273	0.
1	0400	49	334.	*	1	1015	124	82.	*	1	1630	199	0.	*	1	2245	274	0.
1	0405	50	369.	*	1	1020	125	77.	*	1	1635	200	0.	*	1	2250	275	0.
1	0410	51	468.	*	1	1025	126	72.	*	1	1640	201	0.	*	1	2255	276	0.
1	0415	52	566.	*	1	1030	127	67.	*	1	1645	202	0.	*	1	2300	277	0.
1	0420	53	605.	*	1	1035	128	62.	*	1	1650	203	0.	*	1	2305	278	0.
1	0425	54	632.	*	1	1040	129	58.	*	1	1655	204	0.	*	1	2310	279	0.
1	0430	55	653.	*	1	1045	130	54.	*	1	1700	205	0.	*	1	2315	280	0.
1	0435	56	1178.	*	1	1050	131	51.	*	1	1705	206	0.	*	1	2320	281	0.
1	0440	57	2618.	*	1	1055	132	47.	*	1	1710	207	0.	*	1	2325	282	0.
1	0445	58	2656.	*	1	1100	133	44.	*	1	1715	208	0.	*	1	2330	283	0.
1	0450	59	2405.	*	1	1105	134	41.	*	1	1720	209	0.	*	1	2335	284	0.
1	0455	60	2645.	*	1	1110	135	39.	*	1	1725	210	0.	*	1	2340	285	0.
1	0500	61	2446.	*	1	1115	136	36.	*	1	1730	211	0.	*	1	2345	286	0.
1	0505	62	2483.	*	1	1120	137	34.	*	1	1735	212	0.	*	1	2350	287	0.
1	0510	63	2358.	*	1	1125	138	32.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	2303.	*	1	1130	139	30.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	2261.	*	1	1135	140	28.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	2215.	*	1	1140	141	26.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	2197.	*	1	1145	142	25.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	2179.	*	1	1150	143	23.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	2227.	*	1	1155	144	22.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	2293.	*	1	1200	145	20.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	2362.	*	1	1205	146	19.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	2407.	*	1	1210	147	18.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	2383.	*	1	1215	148	17.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	2276.	*	1	1220	149	16.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	2150.	*	1	1225	150	14.	*	1	1840	225	0.	*	2	0055	300	0.

****

PEAK FLOW (CFS)	TIME (HR)	MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
+ 2656.	4.75 (CFS)	1116.	288.	277.	277.
	(INCHES)	.176	.182	.182	.182
	(AC-FT)	553.	571.	571.	571.

CUMULATIVE AREA = 58.84 SQ MI

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HYDROGRAPH AT STATION ULWIN
SUM OF 4 HYDROGRAPHS
PLAN 1, RATIO = .26

****

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	496.	1		1230	151	7.	1		1845	226	0.
1		0005	2	0.	1		0620	77	543.	1		1235	152	7.	1		1850	227	0.
1		0010	3	0.	1		0625	78	515.	1		1240	153	6.	1		1855	228	0.
1		0015	4	0.	1		0630	79	551.	1		1245	154	6.	1		1900	229	0.
1		0020	5	0.	1		0635	80	512.	1		1250	155	6.	1		1905	230	0.
1		0025	6	0.	1		0640	81	500.	1		1255	156	5.	1		1910	231	0.
1		0030	7	0.	1		0645	82	469.	1		1300	157	5.	1		1915	232	0.
1		0035	8	0.	1		0650	83	443.	1		1305	158	5.	1		1920	233	0.
1		0040	9	0.	1		0655	84	419.	1		1310	159	5.	1		1925	234	0.
1		0045	10	0.	1		0700	85	384.	1		1315	160	4.	1		1930	235	0.
1		0050	11	0.	1		0705	86	367.	1		1320	161	4.	1		1935	236	0.
1		0055	12	0.	1		0710	87	346.	1		1325	162	4.	1		1940	237	0.
1		0100	13	0.	1		0715	88	326.	1		1330	163	4.	1		1945	238	0.
1		0105	14	0.	1		0720	89	301.	1		1335	164	4.	1		1950	239	0.
1		0110	15	0.	1		0725	90	283.	1		1340	165	4.	1		1955	240	0.
1		0115	16	0.	1		0730	91	265.	1		1345	166	3.	1		2000	241	0.
1		0120	17	0.	1		0735	92	251.	1		1350	167	3.	1		2005	242	0.
1		0125	18	0.	1		0740	93	234.	1		1355	168	3.	1		2010	243	0.
1		0130	19	0.	1		0745	94	221.	1		1400	169	3.	1		2015	244	0.
1		0135	20	0.	1		0750	95	211.	1		1405	170	3.	1		2020	245	0.
1		0140	21	0.	1		0755	96	200.	1		1410	171	3.	1		2025	246	0.
1		0145	22	0.	1		0800	97	188.	1		1415	172	3.	1		2030	247	0.
1		0150	23	0.	1		0805	98	177.	1		1420	173	2.	1		2035	248	0.
1		0155	24	0.	1		0810	99	165.	1		1425	174	2.	1		2040	249	0.
1		0200	25	0.	1		0815	100	151.	1		1430	175	2.	1		2045	250	0.
1		0205	26	0.	1		0820	101	141.	1		1435	176	2.	1		2050	251	0.

1	0210	27	0.	*	1	0825	102	133.	*	1	1440	177	2.	*	1	2055	252	0.
1	0215	28	0.	*	1	0830	103	126.	*	1	1445	178	2.	*	1	2100	253	0.
1	0220	29	0.	*	1	0835	104	121.	*	1	1450	179	2.	*	1	2105	254	0.
1	0225	30	0.	*	1	0840	105	117.	*	1	1455	180	2.	*	1	2110	255	0.
1	0230	31	0.	*	1	0845	106	110.	*	1	1500	181	1.	*	1	2115	256	0.
1	0235	32	0.	*	1	0850	107	101.	*	1	1505	182	1.	*	1	2120	257	0.
1	0240	33	0.	*	1	0855	108	93.	*	1	1510	183	1.	*	1	2125	258	0.
1	0245	34	0.	*	1	0900	109	88.	*	1	1515	184	1.	*	1	2130	259	0.
1	0250	35	0.	*	1	0905	110	86.	*	1	1520	185	1.	*	1	2135	260	0.
1	0255	36	0.	*	1	0910	111	85.	*	1	1525	186	1.	*	1	2140	261	0.
1	0300	37	1.	*	1	0915	112	82.	*	1	1530	187	1.	*	1	2145	262	0.
1	0305	38	1.	*	1	0920	113	78.	*	1	1535	188	1.	*	1	2150	263	0.
1	0310	39	2.	*	1	0925	114	73.	*	1	1540	189	1.	*	1	2155	264	0.
1	0315	40	3.	*	1	0930	115	69.	*	1	1545	190	1.	*	1	2200	265	0.
1	0320	41	5.	*	1	0935	116	67.	*	1	1550	191	1.	*	1	2205	266	0.
1	0325	42	9.	*	1	0940	117	63.	*	1	1555	192	1.	*	1	2210	267	0.
1	0330	43	14.	*	1	0945	118	58.	*	1	1600	193	1.	*	1	2215	268	0.
1	0335	44	21.	*	1	0950	119	54.	*	1	1605	194	1.	*	1	2220	269	0.
1	0340	45	29.	*	1	0955	120	51.	*	1	1610	195	1.	*	1	2225	270	0.
1	0345	46	35.	*	1	1000	121	49.	*	1	1615	196	1.	*	1	2230	271	0.
1	0350	47	40.	*	1	1005	122	47.	*	1	1620	197	1.	*	1	2235	272	0.
1	0355	48	43.	*	1	1010	123	45.	*	1	1625	198	1.	*	1	2240	273	0.
1	0400	49	48.	*	1	1015	124	42.	*	1	1630	199	1.	*	1	2245	274	0.
1	0405	50	54.	*	1	1020	125	40.	*	1	1635	200	0.	*	1	2250	275	0.
1	0410	51	60.	*	1	1025	126	37.	*	1	1640	201	0.	*	1	2255	276	0.
1	0415	52	65.	*	1	1030	127	35.	*	1	1645	202	0.	*	1	2300	277	0.
1	0420	53	67.	*	1	1035	128	33.	*	1	1650	203	0.	*	1	2305	278	0.
1	0425	54	69.	*	1	1040	129	30.	*	1	1655	204	0.	*	1	2310	279	0.
1	0430	55	70.	*	1	1045	130	28.	*	1	1700	205	0.	*	1	2315	280	0.
1	0435	56	72.	*	1	1050	131	26.	*	1	1705	206	0.	*	1	2320	281	0.
1	0440	57	74.	*	1	1055	132	25.	*	1	1710	207	0.	*	1	2325	282	0.
1	0445	58	77.	*	1	1100	133	23.	*	1	1715	208	0.	*	1	2330	283	0.
1	0450	59	87.	*	1	1105	134	22.	*	1	1720	209	0.	*	1	2335	284	0.
1	0455	60	108.	*	1	1110	135	20.	*	1	1725	210	0.	*	1	2340	285	0.
1	0500	61	106.	*	1	1115	136	19.	*	1	1730	211	0.	*	1	2345	286	0.
1	0505	62	108.	*	1	1120	137	18.	*	1	1735	212	0.	*	1	2350	287	0.
1	0510	63	114.	*	1	1125	138	16.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	112.	*	1	1130	139	15.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	113.	*	1	1135	140	14.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	113.	*	1	1140	141	13.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	196.	*	1	1145	142	13.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	576.	*	1	1150	143	12.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	577.	*	1	1155	144	11.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	368.	*	1	1200	145	10.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	564.	*	1	1205	146	10.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	462.	*	1	1210	147	9.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	417.	*	1	1215	148	9.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	554.	*	1	1220	149	8.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	445.	*	1	1225	150	8.	*	1	1840	225	0.	*	2	0055	300	0.

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PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
+		(CFS)				
+ 577.	5.67		222.	59.	57.	57.
		(INCHES)	.035	.037	.037	.037
		(AC-FT)	110.	117.	117.	117.

CUMULATIVE AREA = 58.84 SQ MI

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            **************
            *            *
1305 KK     *    FINISH  *
            *            *
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1307 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE

HYDROGRAPH ROUTING DATA

1306 RD MUSKINGUM-CUNGE CHANNEL ROUTING

L	1500.	CHANNEL LENGTH
S	.0090	SLOPE
N	.050	CHANNEL ROUGHNESS COEFFICIENT
CA	.00	CONTRIBUTING AREA
SHAPE	TRAP	CHANNEL SHAPE
WD	250.00	BOTTOM WIDTH OR DIAMETER
Z	3.00	SIDE SLOPE

***

COMPUTED MUSKINGUM-CUNGE PARAMETERS

ELEMENT	ALPHA	M	COMPUTATION TIME STEP DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	.08	1.64	2.45	750.00	11279.67	377.53	1.14	10.20
INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL								
MAIN	.08	1.64	5.00		11268.66	380.00	1.14	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5383E+04 EXCESS= .0000E+00 OUTFLOW= .5383E+04 BASIN STORAGE= .1063E-01 PERCENT ERROR= .0

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HYDROGRAPH AT STATION FINISH
PLAN 1, RATIO = 1.00

****

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	11262.	1		1230	151	2683.	1		1845	226	176.
1		0005	2	0.	1		0620	77	11269.	1		1235	152	2660.	1		1850	227	138.
1		0010	3	0.	1		0625	78	11154.	1		1240	153	2636.	1		1855	228	105.
1		0015	4	0.	1		0630	79	10948.	1		1245	154	2611.	1		1900	229	79.
1		0020	5	0.	1		0635	80	10670.	1		1250	155	2587.	1		1905	230	59.
1		0025	6	0.	1		0640	81	10339.	1		1255	156	2563.	1		1910	231	44.
1		0030	7	0.	1		0645	82	9970.	1		1300	157	2540.	1		1915	232	33.
1		0035	8	1.	1		0650	83	9577.	1		1305	158	2516.	1		1920	233	25.
1		0040	9	3.	1		0655	84	9168.	1		1310	159	2492.	1		1925	234	18.
1		0045	10	6.	1		0700	85	8750.	1		1315	160	2467.	1		1930	235	14.
1		0050	11	11.	1		0705	86	8329.	1		1320	161	2442.	1		1935	236	10.
1		0055	12	20.	1		0710	87	7911.	1		1325	162	2416.	1		1940	237	8.
1		0100	13	31.	1		0715	88	7498.	1		1330	163	2390.	1		1945	238	6.
1		0105	14	46.	1		0720	89	7094.	1		1335	164	2365.	1		1950	239	4.
1		0110	15	64.	1		0725	90	6698.	1		1340	165	2340.	1		1955	240	3.
1		0115	16	85.	1		0730	91	6313.	1		1345	166	2315.	1		2000	241	2.
1		0120	17	107.	1		0735	92	5938.	1		1350	167	2288.	1		2005	242	2.
1		0125	18	131.	1		0740	93	5577.	1		1355	168	2260.	1		2010	243	1.
1		0130	19	155.	1		0745	94	5237.	1		1400	169	2232.	1		2015	244	1.
1		0135	20	181.	1		0750	95	4938.	1		1405	170	2204.	1		2020	245	1.
1		0140	21	210.	1		0755	96	4710.	1		1410	171	2176.	1		2025	246	1.
1		0145	22	243.	1		0800	97	4562.	1		1415	172	2149.	1		2030	247	0.
1		0150	23	283.	1		0805	98	4464.	1		1420	173	2121.	1		2035	248	0.
1		0155	24	330.	1		0810	99	4382.	1		1425	174	2092.	1		2040	249	0.
1		0200	25	387.	1		0815	100	4304.	1		1430	175	2061.	1		2045	250	0.
1		0205	26	456.	1		0820	101	4232.	1		1435	176	2030.	1		2050	251	0.
1		0210	27	536.	1		0825	102	4163.	1		1440	177	1998.	1		2055	252	0.
1		0215	28	625.	1		0830	103	4098.	1		1445	178	1968.	1		2100	253	0.
1		0220	29	721.	1		0835	104	4037.	1		1450	179	1937.	1		2105	254	0.
1		0225	30	816.	1		0840	105	3979.	1		1455	180	1906.	1		2110	255	0.
1		0230	31	902.	1		0845	106	3924.	1		1500	181	1872.	1		2115	256	0.
1		0235	32	980.	1		0850	107	3872.	1		1505	182	1836.	1		2120	257	0.
1		0240	33	1051.	1		0855	108	3823.	1		1510	183	1801.	1		2125	258	0.
1		0245	34	1115.	1		0900	109	3777.	1		1515	184	1766.	1		2130	259	0.
1		0250	35	1175.	1		0905	110	3733.	1		1520	185	1732.	1		2135	260	0.
1		0255	36	1240.	1		0910	111	3692.	1		1525	186	1697.	1		2140	261	0.
1		0300	37	1315.	1		0915	112	3653.	1		1530	187	1661.	1		2145	262	0.
1		0305	38	1405.	1		0920	113	3616.	1		1535	188	1624.	1		2150	263	0.
1		0310	39	1523.	1		0925	114	3581.	1		1540	189	1587.	1		2155	264	0.
1		0315	40	1690.	1		0930	115	3548.	1		1545	190	1550.	1		2200	265	0.
1		0320	41	1927.	1		0935	116	3515.	1		1550	191	1515.	1		2205	266	0.
1		0325	42	2253.	1		0940	117	3483.	1		1555	192	1479.	1		2210	267	0.
1		0330	43	2688.	1		0945	118	3452.	1		1600	193	1441.	1		2215	268	0.

1	0335	44	3248.	*	1	0950	119	3422.	*	1	1605	194	1402.	*	1	2220	269	0.
1	0340	45	3920.	*	1	0955	120	3394.	*	1	1610	195	1364.	*	1	2225	270	0.
1	0345	46	4672.	*	1	1000	121	3366.	*	1	1615	196	1326.	*	1	2230	271	0.
1	0350	47	5478.	*	1	1005	122	3340.	*	1	1620	197	1290.	*	1	2235	272	0.
1	0355	48	6299.	*	1	1010	123	3314.	*	1	1625	198	1253.	*	1	2240	273	0.
1	0400	49	7068.	*	1	1015	124	3290.	*	1	1630	199	1215.	*	1	2245	274	0.
1	0405	50	7730.	*	1	1020	125	3265.	*	1	1635	200	1175.	*	1	2250	275	0.
1	0410	51	8277.	*	1	1025	126	3241.	*	1	1640	201	1136.	*	1	2255	276	0.
1	0415	52	8722.	*	1	1030	127	3216.	*	1	1645	202	1097.	*	1	2300	277	0.
1	0420	53	9062.	*	1	1035	128	3192.	*	1	1650	203	1060.	*	1	2305	278	0.
1	0425	54	9284.	*	1	1040	129	3168.	*	1	1655	204	1023.	*	1	2310	279	0.
1	0430	55	9398.	*	1	1045	130	3145.	*	1	1700	205	986.	*	1	2315	280	0.
1	0435	56	9438.	*	1	1050	131	3123.	*	1	1705	206	947.	*	1	2320	281	0.
1	0440	57	9439.	*	1	1055	132	3101.	*	1	1710	207	907.	*	1	2325	282	0.
1	0445	58	9426.	*	1	1100	133	3079.	*	1	1715	208	868.	*	1	2330	283	0.
1	0450	59	9443.	*	1	1105	134	3058.	*	1	1720	209	831.	*	1	2335	284	0.
1	0455	60	9527.	*	1	1110	135	3037.	*	1	1725	210	795.	*	1	2340	285	0.
1	0500	61	9672.	*	1	1115	136	3014.	*	1	1730	211	760.	*	1	2345	286	0.
1	0505	62	9844.	*	1	1120	137	2992.	*	1	1735	212	722.	*	1	2350	287	0.
1	0510	63	10017.	*	1	1125	138	2970.	*	1	1740	213	682.	*	1	2355	288	0.
1	0515	64	10170.	*	1	1130	139	2948.	*	1	1745	214	641.	*	2	0000	289	0.
1	0520	65	10269.	*	1	1135	140	2926.	*	1	1750	215	601.	*	2	0005	290	0.
1	0525	66	10296.	*	1	1140	141	2905.	*	1	1755	216	563.	*	2	0010	291	0.
1	0530	67	10250.	*	1	1145	142	2884.	*	1	1800	217	528.	*	2	0015	292	0.
1	0535	68	10137.	*	1	1150	143	2863.	*	1	1805	218	493.	*	2	0020	293	0.
1	0540	69	9970.	*	1	1155	144	2840.	*	1	1810	219	450.	*	2	0025	294	0.
1	0545	70	9775.	*	1	1200	145	2818.	*	1	1815	220	403.	*	2	0030	295	0.
1	0550	71	9648.	*	1	1205	146	2795.	*	1	1820	221	357.	*	2	0035	296	0.
1	0555	72	9780.	*	1	1210	147	2772.	*	1	1825	222	316.	*	2	0040	297	0.
1	0600	73	10239.	*	1	1215	148	2749.	*	1	1830	223	279.	*	2	0045	298	0.
1	0605	74	10767.	*	1	1220	149	2727.	*	1	1835	224	245.	*	2	0050	299	0.
1	0610	75	11111.	*	1	1225	150	2705.	*	1	1840	225	212.	*	2	0055	300	0.

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PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)				
		(CFS)			
+ 11269.	6.33	7379.	2714.	2614.	2614.
		(INCHES) .772	1.136	1.136	1.136
		(AC-FT) 3659.	5383.	5383.	5383.

CUMULATIVE AREA = 88.86 SQ MI

COMPUTED MUSKINGUM-CUNGE PARAMETERS

ELEMENT	ALPHA	M	COMPUTATION TIME STEP DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	.08	1.64	2.73	750.00	8549.73	324.96	.88	9.16

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

MAIN	.08	1.64	5.00		8549.72	325.00	.88

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4175E+04 EXCESS= .0000E+00 OUTFLOW= .4175E+04 BASIN STORAGE= .1056E-01 PERCENT ERROR= .0

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HYDROGRAPH AT STATION FINISH
PLAN 1, RATIO = .87

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DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	6964.	1		1230	151	2378.	1		1845	226	6.
1		0005	2	0.	1		0620	77	6778.	1		1235	152	2352.	1		1850	227	5.
1		0010	3	0.	1		0625	78	6598.	1		1240	153	2326.	1		1855	228	4.
1		0015	4	0.	1		0630	79	6422.	1		1245	154	2299.	1		1900	229	3.
1		0020	5	0.	1		0635	80	6252.	1		1250	155	2270.	1		1905	230	2.
1		0025	6	0.	1		0640	81	6085.	1		1255	156	2241.	1		1910	231	2.
1		0030	7	0.	1		0645	82	5923.	1		1300	157	2213.	1		1915	232	1.
1		0035	8	0.	1		0650	83	5767.	1		1305	158	2185.	1		1920	233	1.

1	0040	9	0.	*	1	0655	84	5617.	*	1	1310	159	2157.	*	1	1925	234	1.
1	0045	10	1.	*	1	0700	85	5474.	*	1	1315	160	2129.	*	1	1930	235	0.
1	0050	11	2.	*	1	0705	86	5337.	*	1	1320	161	2099.	*	1	1935	236	0.
1	0055	12	4.	*	1	0710	87	5206.	*	1	1325	162	2068.	*	1	1940	237	0.
1	0100	13	7.	*	1	0715	88	5081.	*	1	1330	163	2036.	*	1	1945	238	0.
1	0105	14	12.	*	1	0720	89	4962.	*	1	1335	164	2004.	*	1	1950	239	0.
1	0110	15	18.	*	1	0725	90	4849.	*	1	1340	165	1973.	*	1	1955	240	0.
1	0115	16	26.	*	1	0730	91	4741.	*	1	1345	166	1942.	*	1	2000	241	0.
1	0120	17	35.	*	1	0735	92	4636.	*	1	1350	167	1910.	*	1	2005	242	0.
1	0125	18	46.	*	1	0740	93	4534.	*	1	1355	168	1876.	*	1	2010	243	0.
1	0130	19	59.	*	1	0745	94	4438.	*	1	1400	169	1840.	*	1	2015	244	0.
1	0135	20	74.	*	1	0750	95	4346.	*	1	1405	170	1804.	*	1	2020	245	0.
1	0140	21	91.	*	1	0755	96	4260.	*	1	1410	171	1769.	*	1	2025	246	0.
1	0145	22	112.	*	1	0800	97	4181.	*	1	1415	172	1735.	*	1	2030	247	0.
1	0150	23	136.	*	1	0805	98	4107.	*	1	1420	173	1700.	*	1	2035	248	0.
1	0155	24	165.	*	1	0810	99	4037.	*	1	1425	174	1664.	*	1	2040	249	0.
1	0200	25	199.	*	1	0815	100	3972.	*	1	1430	175	1626.	*	1	2045	250	0.
1	0205	26	239.	*	1	0820	101	3910.	*	1	1435	176	1589.	*	1	2050	251	0.
1	0210	27	286.	*	1	0825	102	3851.	*	1	1440	177	1553.	*	1	2055	252	0.
1	0215	28	338.	*	1	0830	103	3796.	*	1	1445	178	1517.	*	1	2100	253	0.
1	0220	29	395.	*	1	0835	104	3744.	*	1	1450	179	1481.	*	1	2105	254	0.
1	0225	30	455.	*	1	0840	105	3694.	*	1	1455	180	1444.	*	1	2110	255	0.
1	0230	31	518.	*	1	0845	106	3647.	*	1	1500	181	1405.	*	1	2115	256	0.
1	0235	32	581.	*	1	0850	107	3602.	*	1	1505	182	1366.	*	1	2120	257	0.
1	0240	33	641.	*	1	0855	108	3559.	*	1	1510	183	1329.	*	1	2125	258	0.
1	0245	34	695.	*	1	0900	109	3518.	*	1	1515	184	1292.	*	1	2130	259	0.
1	0250	35	738.	*	1	0905	110	3479.	*	1	1520	185	1255.	*	1	2135	260	0.
1	0255	36	776.	*	1	0910	111	3442.	*	1	1525	186	1217.	*	1	2140	261	0.
1	0300	37	817.	*	1	0915	112	3406.	*	1	1530	187	1178.	*	1	2145	262	0.
1	0305	38	873.	*	1	0920	113	3371.	*	1	1535	188	1138.	*	1	2150	263	0.
1	0310	39	956.	*	1	0925	114	3337.	*	1	1540	189	1100.	*	1	2155	264	0.
1	0315	40	1079.	*	1	0930	115	3305.	*	1	1545	190	1062.	*	1	2200	265	0.
1	0320	41	1258.	*	1	0935	116	3273.	*	1	1550	191	1025.	*	1	2205	266	0.
1	0325	42	1505.	*	1	0940	117	3243.	*	1	1555	192	988.	*	1	2210	267	0.
1	0330	43	1839.	*	1	0945	118	3214.	*	1	1600	193	949.	*	1	2215	268	0.
1	0335	44	2277.	*	1	0950	119	3186.	*	1	1605	194	909.	*	1	2220	269	0.
1	0340	45	2808.	*	1	0955	120	3159.	*	1	1610	195	870.	*	1	2225	270	0.
1	0345	46	3413.	*	1	1000	121	3132.	*	1	1615	196	833.	*	1	2230	271	0.
1	0350	47	4067.	*	1	1005	122	3105.	*	1	1620	197	797.	*	1	2235	272	0.
1	0355	48	4738.	*	1	1010	123	3077.	*	1	1625	198	762.	*	1	2240	273	0.
1	0400	49	5368.	*	1	1015	124	3050.	*	1	1630	199	725.	*	1	2245	274	0.
1	0405	50	5909.	*	1	1020	125	3024.	*	1	1635	200	686.	*	1	2250	275	0.
1	0410	51	6356.	*	1	1025	126	2999.	*	1	1640	201	647.	*	1	2255	276	0.
1	0415	52	6728.	*	1	1030	127	2974.	*	1	1645	202	609.	*	1	2300	277	0.
1	0420	53	7036.	*	1	1035	128	2949.	*	1	1650	203	573.	*	1	2305	278	0.
1	0425	54	7273.	*	1	1040	129	2925.	*	1	1655	204	539.	*	1	2310	279	0.
1	0430	55	7432.	*	1	1045	130	2901.	*	1	1700	205	505.	*	1	2315	280	0.
1	0435	56	7526.	*	1	1050	131	2877.	*	1	1705	206	469.	*	1	2320	281	0.
1	0440	57	7576.	*	1	1055	132	2852.	*	1	1710	207	428.	*	1	2325	282	0.
1	0445	58	7606.	*	1	1100	133	2827.	*	1	1715	208	384.	*	1	2330	283	0.
1	0450	59	7654.	*	1	1105	134	2803.	*	1	1720	209	343.	*	1	2335	284	0.
1	0455	60	7753.	*	1	1110	135	2779.	*	1	1725	210	305.	*	1	2340	285	0.
1	0500	61	7902.	*	1	1115	136	2755.	*	1	1730	211	271.	*	1	2345	286	0.
1	0505	62	8072.	*	1	1120	137	2732.	*	1	1735	212	239.	*	1	2350	287	0.
1	0510	63	8243.	*	1	1125	138	2708.	*	1	1740	213	207.	*	1	2355	288	0.
1	0515	64	8395.	*	1	1130	139	2684.	*	1	1745	214	171.	*	2	0000	289	0.
1	0520	65	8503.	*	1	1135	140	2659.	*	1	1750	215	135.	*	2	0005	290	0.
1	0525	66	8550.	*	1	1140	141	2633.	*	1	1755	216	103.	*	2	0010	291	0.
1	0530	67	8533.	*	1	1145	142	2608.	*	1	1800	217	78.	*	2	0015	292	0.
1	0535	68	8461.	*	1	1150	143	2584.	*	1	1805	218	59.	*	2	0020	293	0.
1	0540	69	8342.	*	1	1155	144	2559.	*	1	1810	219	45.	*	2	0025	294	0.
1	0545	70	8184.	*	1	1200	145	2535.	*	1	1815	220	34.	*	2	0030	295	0.
1	0550	71	7999.	*	1	1205	146	2510.	*	1	1820	221	25.	*	2	0035	296	0.
1	0555	72	7796.	*	1	1210	147	2484.	*	1	1825	222	19.	*	2	0040	297	0.
1	0600	73	7584.	*	1	1215	148	2457.	*	1	1830	223	15.	*	2	0045	298	0.
1	0605	74	7369.	*	1	1220	149	2431.	*	1	1835	224	11.	*	2	0050	299	0.
1	0610	75	7160.	*	1	1225	150	2404.	*	1	1840	225	8.	*	2	0055	300	0.
				*					*					*				

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 8550.	5.42		5669.	2105.	2027.	2027.
		(INCHES)	.593	.881	.881	.881
		(AC-FT)	2811.	4175.	4175.	4175.

CUMULATIVE AREA = 88.86 SQ MI

COMPUTED MUSKINGUM-CUNGE PARAMETERS

ELEMENT	ALPHA	COMPUTATION TIME STEP M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	.08	1.64	2.99	750.00	6767.18	328.96	.64	8.36

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

MAIN	.08	1.64	5.00		6763.94	330.00	.64	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3052E+04 EXCESS= .0000E+00 OUTFLOW= .3052E+04 BASIN STORAGE= .1017E-01 PERCENT ERROR= .0

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HYDROGRAPH AT STATION FINISH
PLAN 1, RATIO = .74

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DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	5688.	1		1230	151	1578.	1		1845	226	0.
1		0005	2	0.	1		0620	77	5555.	1		1235	152	1541.	1		1850	227	0.
1		0010	3	0.	1		0625	78	5425.	1		1240	153	1504.	1		1855	228	0.
1		0015	4	0.	1		0630	79	5298.	1		1245	154	1466.	1		1900	229	0.
1		0020	5	0.	1		0635	80	5174.	1		1250	155	1427.	1		1905	230	0.
1		0025	6	0.	1		0640	81	5051.	1		1255	156	1388.	1		1910	231	0.
1		0030	7	0.	1		0645	82	4930.	1		1300	157	1349.	1		1915	232	0.
1		0035	8	0.	1		0650	83	4813.	1		1305	158	1311.	1		1920	233	0.
1		0040	9	0.	1		0655	84	4701.	1		1310	159	1274.	1		1925	234	0.
1		0045	10	0.	1		0700	85	4592.	1		1315	160	1236.	1		1930	235	0.
1		0050	11	0.	1		0705	86	4486.	1		1320	161	1197.	1		1935	236	0.
1		0055	12	0.	1		0710	87	4385.	1		1325	162	1157.	1		1940	237	0.
1		0100	13	0.	1		0715	88	4288.	1		1330	163	1117.	1		1945	238	0.
1		0105	14	1.	1		0720	89	4195.	1		1335	164	1079.	1		1950	239	0.
1		0110	15	2.	1		0725	90	4106.	1		1340	165	1042.	1		1955	240	0.
1		0115	16	3.	1		0730	91	4020.	1		1345	166	1004.	1		2000	241	0.
1		0120	17	5.	1		0735	92	3937.	1		1350	167	966.	1		2005	242	0.
1		0125	18	8.	1		0740	93	3855.	1		1355	168	926.	1		2010	243	0.
1		0130	19	12.	1		0745	94	3777.	1		1400	169	886.	1		2015	244	0.
1		0135	20	17.	1		0750	95	3703.	1		1405	170	848.	1		2020	245	0.
1		0140	21	24.	1		0755	96	3633.	1		1410	171	812.	1		2025	246	0.
1		0145	22	34.	1		0800	97	3567.	1		1415	172	776.	1		2030	247	0.
1		0150	23	45.	1		0805	98	3504.	1		1420	173	740.	1		2035	248	0.
1		0155	24	60.	1		0810	99	3446.	1		1425	174	701.	1		2040	249	0.
1		0200	25	78.	1		0815	100	3391.	1		1430	175	662.	1		2045	250	0.
1		0205	26	100.	1		0820	101	3338.	1		1435	176	623.	1		2050	251	0.
1		0210	27	126.	1		0825	102	3287.	1		1440	177	587.	1		2055	252	0.
1		0215	28	155.	1		0830	103	3238.	1		1445	178	552.	1		2100	253	0.
1		0220	29	187.	1		0835	104	3190.	1		1450	179	519.	1		2105	254	0.
1		0225	30	221.	1		0840	105	3145.	1		1455	180	485.	1		2110	255	0.
1		0230	31	256.	1		0845	106	3101.	1		1500	181	447.	1		2115	256	0.
1		0235	32	291.	1		0850	107	3059.	1		1505	182	407.	1		2120	257	0.
1		0240	33	323.	1		0855	108	3018.	1		1510	183	367.	1		2125	258	0.
1		0245	34	352.	1		0900	109	2979.	1		1515	184	328.	1		2130	259	0.
1		0250	35	379.	1		0905	110	2941.	1		1520	185	292.	1		2135	260	0.
1		0255	36	406.	1		0910	111	2904.	1		1525	186	260.	1		2140	261	0.
1		0300	37	436.	1		0915	112	2868.	1		1530	187	230.	1		2145	262	0.
1		0305	38	473.	1		0920	113	2832.	1		1535	188	197.	1		2150	263	0.
1		0310	39	527.	1		0925	114	2797.	1		1540	189	161.	1		2155	264	0.
1		0315	40	603.	1		0930	115	2763.	1		1545	190	125.	1		2200	265	0.
1		0320	41	711.	1		0935	116	2730.	1		1550	191	96.	1		2205	266	0.
1		0325	42	866.	1		0940	117	2698.	1		1555	192	73.	1		2210	267	0.
1		0330	43	1083.	1		0945	118	2666.	1		1600	193	55.	1		2215	268	0.
1		0335	44	1381.	1		0950	119	2635.	1		1605	194	42.	1		2220	269	0.
1		0340	45	1776.	1		0955	120	2604.	1		1610	195	32.	1		2225	270	0.
1		0345	46	2244.	1		1000	121	2572.	1		1615	196	24.	1		2230	271	0.
1		0350	47	2756.	1		1005	122	2540.	1		1620	197	18.	1		2235	272	0.
1		0355	48	3284.	1		1010	123	2508.	1		1625	198	14.	1		2240	273	0.
1		0400	49	3780.	1		1015	124	2478.	1		1630	199	11.	1		2245	274	0.
1		0405	50	4211.	1		1020	125	2448.	1		1635	200	8.	1		2250	275	0.
1		0410	51	4565.	1		1025	126	2418.	1		1640	201	6.	1		2255	276	0.
1		0415	52	4850.	1		1030	127	2388.	1		1645	202	5.	1		2300	277	0.
1		0420	53	5089.	1		1035	128	2358.	1		1650	203	4.	1		2305	278	0.
1		0425	54	5289.	1		1040	129	2326.	1		1655	204	3.	1		2310	279	0.

1	0430	55	5452.	*	1	1045	130	2295.	*	1	1700	205	2.	*	1	2315	280	0.
1	0435	56	5583.	*	1	1050	131	2264.	*	1	1705	206	2.	*	1	2320	281	0.
1	0440	57	5686.	*	1	1055	132	2234.	*	1	1710	207	1.	*	1	2325	282	0.
1	0445	58	5768.	*	1	1100	133	2204.	*	1	1715	208	1.	*	1	2330	283	0.
1	0450	59	5852.	*	1	1105	134	2173.	*	1	1720	209	1.	*	1	2335	284	0.
1	0455	60	5968.	*	1	1110	135	2142.	*	1	1725	210	0.	*	1	2340	285	0.
1	0500	61	6118.	*	1	1115	136	2109.	*	1	1730	211	0.	*	1	2345	286	0.
1	0505	62	6280.	*	1	1120	137	2076.	*	1	1735	212	0.	*	1	2350	287	0.
1	0510	63	6440.	*	1	1125	138	2042.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	6585.	*	1	1130	139	2010.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	6697.	*	1	1135	140	1977.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	6756.	*	1	1140	141	1944.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	6764.	*	1	1145	142	1909.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	6729.	*	1	1150	143	1873.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	6656.	*	1	1155	144	1836.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	6551.	*	1	1200	145	1800.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	6423.	*	1	1205	146	1764.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	6280.	*	1	1210	147	1728.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	6131.	*	1	1215	148	1692.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	5979.	*	1	1220	149	1654.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	5830.	*	1	1225	150	1615.	*	1	1840	225	0.	*	2	0055	300	0.

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PEAK FLOW (CFS)	TIME (HR)	MAXIMUM AVERAGE FLOW (CFS) 6-HR	24-HR	72-HR	24.92-HR
+ 6764.	5.50	4547.	1539.	1482.	1482.
		(INCHES) .476	.644	.644	.644
		(AC-FT) 2255.	3052.	3052.	3052.

CUMULATIVE AREA = 88.86 SQ MI

COMPUTED MUSKINGUM-CUNGE PARAMETERS
COMPUTATION TIME STEP

ELEMENT	ALPHA	M	DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	.08	1.64	3.54	750.00	4393.92	332.55	.37	7.07

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

MAIN	.08	1.64	5.00		4390.90	335.00	.37

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1751E+04 EXCESS= .0000E+00 OUTFLOW= .1751E+04 BASIN STORAGE= .1218E-01 PERCENT ERROR= .0

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HYDROGRAPH AT STATION FINISH
PLAN 1, RATIO = .57

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DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	3879.	1		1230	151	429.	1		1845	226	0.
1		0005	2	0.	1		0620	77	3808.	1		1235	152	390.	1		1850	227	0.
1		0010	3	0.	1		0625	78	3738.	1		1240	153	354.	1		1855	228	0.
1		0015	4	0.	1		0630	79	3669.	1		1245	154	321.	1		1900	229	0.
1		0020	5	0.	1		0635	80	3599.	1		1250	155	290.	1		1905	230	0.
1		0025	6	0.	1		0640	81	3528.	1		1255	156	262.	1		1910	231	0.
1		0030	7	0.	1		0645	82	3458.	1		1300	157	235.	1		1915	232	0.
1		0035	8	0.	1		0650	83	3388.	1		1305	158	205.	1		1920	233	0.
1		0040	9	0.	1		0655	84	3319.	1		1310	159	172.	1		1925	234	0.
1		0045	10	0.	1		0700	85	3251.	1		1315	160	139.	1		1930	235	0.
1		0050	11	0.	1		0705	86	3184.	1		1320	161	110.	1		1935	236	0.
1		0055	12	0.	1		0710	87	3119.	1		1325	162	86.	1		1940	237	0.
1		0100	13	0.	1		0715	88	3055.	1		1330	163	67.	1		1945	238	0.
1		0105	14	0.	1		0720	89	2994.	1		1335	164	53.	1		1950	239	0.
1		0110	15	0.	1		0725	90	2934.	1		1340	165	42.	1		1955	240	0.
1		0115	16	0.	1		0730	91	2875.	1		1345	166	33.	1		2000	241	0.
1		0120	17	0.	1		0735	92	2818.	1		1350	167	27.	1		2005	242	0.
1		0125	18	0.	1		0740	93	2761.	1		1355	168	22.	1		2010	243	0.
1		0130	19	0.	1		0745	94	2706.	1		1400	169	18.	1		2015	244	0.

1	0135	20	0.	*	1	0750	95	2652.	*	1	1405	170	15.	*	1	2020	245	0.
1	0140	21	0.	*	1	0755	96	2600.	*	1	1410	171	12.	*	1	2025	246	0.
1	0145	22	1.	*	1	0800	97	2550.	*	1	1415	172	10.	*	1	2030	247	0.
1	0150	23	2.	*	1	0805	98	2502.	*	1	1420	173	8.	*	1	2035	248	0.
1	0155	24	4.	*	1	0810	99	2454.	*	1	1425	174	7.	*	1	2040	249	0.
1	0200	25	6.	*	1	0815	100	2407.	*	1	1430	175	6.	*	1	2045	250	0.
1	0205	26	10.	*	1	0820	101	2362.	*	1	1435	176	5.	*	1	2050	251	0.
1	0210	27	15.	*	1	0825	102	2317.	*	1	1440	177	4.	*	1	2055	252	0.
1	0215	28	22.	*	1	0830	103	2274.	*	1	1445	178	4.	*	1	2100	253	0.
1	0220	29	31.	*	1	0835	104	2232.	*	1	1450	179	3.	*	1	2105	254	0.
1	0225	30	41.	*	1	0840	105	2191.	*	1	1455	180	3.	*	1	2110	255	0.
1	0230	31	53.	*	1	0845	106	2151.	*	1	1500	181	3.	*	1	2115	256	0.
1	0235	32	66.	*	1	0850	107	2111.	*	1	1505	182	2.	*	1	2120	257	0.
1	0240	33	78.	*	1	0855	108	2070.	*	1	1510	183	2.	*	1	2125	258	0.
1	0245	34	91.	*	1	0900	109	2028.	*	1	1515	184	2.	*	1	2130	259	0.
1	0250	35	102.	*	1	0905	110	1986.	*	1	1520	185	2.	*	1	2135	260	0.
1	0255	36	114.	*	1	0910	111	1946.	*	1	1525	186	1.	*	1	2140	261	0.
1	0300	37	126.	*	1	0915	112	1906.	*	1	1530	187	1.	*	1	2145	262	0.
1	0305	38	141.	*	1	0920	113	1868.	*	1	1535	188	1.	*	1	2150	263	0.
1	0310	39	160.	*	1	0925	114	1829.	*	1	1540	189	1.	*	1	2155	264	0.
1	0315	40	187.	*	1	0930	115	1790.	*	1	1545	190	1.	*	1	2200	265	0.
1	0320	41	227.	*	1	0935	116	1750.	*	1	1550	191	1.	*	1	2205	266	0.
1	0325	42	285.	*	1	0940	117	1710.	*	1	1555	192	1.	*	1	2210	267	0.
1	0330	43	378.	*	1	0945	118	1671.	*	1	1600	193	1.	*	1	2215	268	0.
1	0335	44	520.	*	1	0950	119	1633.	*	1	1605	194	1.	*	1	2220	269	0.
1	0340	45	719.	*	1	0955	120	1595.	*	1	1610	195	0.	*	1	2225	270	0.
1	0345	46	976.	*	1	1000	121	1557.	*	1	1615	196	0.	*	1	2230	271	0.
1	0350	47	1279.	*	1	1005	122	1518.	*	1	1620	197	0.	*	1	2235	272	0.
1	0355	48	1605.	*	1	1010	123	1478.	*	1	1625	198	0.	*	1	2240	273	0.
1	0400	49	1929.	*	1	1015	124	1438.	*	1	1630	199	0.	*	1	2245	274	0.
1	0405	50	2215.	*	1	1020	125	1399.	*	1	1635	200	0.	*	1	2250	275	0.
1	0410	51	2452.	*	1	1025	126	1361.	*	1	1640	201	0.	*	1	2255	276	0.
1	0415	52	2650.	*	1	1030	127	1323.	*	1	1645	202	0.	*	1	2300	277	0.
1	0420	53	2805.	*	1	1035	128	1285.	*	1	1650	203	0.	*	1	2305	278	0.
1	0425	54	2921.	*	1	1040	129	1247.	*	1	1655	204	0.	*	1	2310	279	0.
1	0430	55	3006.	*	1	1045	130	1207.	*	1	1700	205	0.	*	1	2315	280	0.
1	0435	56	3084.	*	1	1050	131	1167.	*	1	1705	206	0.	*	1	2320	281	0.
1	0440	57	3180.	*	1	1055	132	1128.	*	1	1710	207	0.	*	1	2325	282	0.
1	0445	58	3293.	*	1	1100	133	1090.	*	1	1715	208	0.	*	1	2330	283	0.
1	0450	59	3420.	*	1	1105	134	1053.	*	1	1720	209	0.	*	1	2335	284	0.
1	0455	60	3562.	*	1	1110	135	1016.	*	1	1725	210	0.	*	1	2340	285	0.
1	0500	61	3721.	*	1	1115	136	977.	*	1	1730	211	0.	*	1	2345	286	0.
1	0505	62	3880.	*	1	1120	137	938.	*	1	1735	212	0.	*	1	2350	287	0.
1	0510	63	4029.	*	1	1125	138	899.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	4167.	*	1	1130	139	862.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	4277.	*	1	1135	140	826.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	4350.	*	1	1140	141	790.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	4387.	*	1	1145	142	754.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	4391.	*	1	1150	143	717.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	4371.	*	1	1155	144	678.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	4324.	*	1	1200	145	639.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	4260.	*	1	1205	146	603.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	4188.	*	1	1210	147	569.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	4111.	*	1	1215	148	535.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	4033.	*	1	1220	149	502.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	3955.	*	1	1225	150	467.	*	1	1840	225	0.	*	2	0055	300	0.
				*					*					*				

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PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)				
		(CFS)			
+ 4391.	5.58	2967.	883.	850.	850.
		(INCHES) .310	.369	.369	.369
		(AC-FT) 1471.	1751.	1751.	1751.

CUMULATIVE AREA = 88.86 SQ MI

COMPUTED MUSKINGUM-CUNGE PARAMETERS

ELEMENT	ALPHA	M	COMPUTATION TIME STEP DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	.08	1.64	4.34	750.00	2600.14	338.39	.20	5.76

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

MAIN .08 1.64 5.00 2598.41 340.00 .20

CONTINUITY SUMMARY (AC-FT) - INFLOW= .9339E+03 EXCESS= .0000E+00 OUTFLOW= .9339E+03 BASIN STORAGE= .9589E-02 PERCENT ERROR= .0

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HYDROGRAPH AT STATION FINISH
PLAN 1, RATIO = .44

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DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	2382.	1		1230	151	41.	1		1845	226	0.
1		0005	2	0.	1		0620	77	2354.	1		1235	152	38.	1		1850	227	0.
1		0010	3	0.	1		0625	78	2325.	1		1240	153	35.	1		1855	228	0.
1		0015	4	0.	1		0630	79	2294.	1		1245	154	32.	1		1900	229	0.
1		0020	5	0.	1		0635	80	2261.	1		1250	155	30.	1		1905	230	0.
1		0025	6	0.	1		0640	81	2225.	1		1255	156	28.	1		1910	231	0.
1		0030	7	0.	1		0645	82	2186.	1		1300	157	26.	1		1915	232	0.
1		0035	8	0.	1		0650	83	2146.	1		1305	158	24.	1		1920	233	0.
1		0040	9	0.	1		0655	84	2107.	1		1310	159	23.	1		1925	234	0.
1		0045	10	0.	1		0700	85	2067.	1		1315	160	21.	1		1930	235	0.
1		0050	11	0.	1		0705	86	2027.	1		1320	161	20.	1		1935	236	0.
1		0055	12	0.	1		0710	87	1987.	1		1325	162	18.	1		1940	237	0.
1		0100	13	0.	1		0715	88	1947.	1		1330	163	17.	1		1945	238	0.
1		0105	14	0.	1		0720	89	1907.	1		1335	164	16.	1		1950	239	0.
1		0110	15	0.	1		0725	90	1867.	1		1340	165	15.	1		1955	240	0.
1		0115	16	0.	1		0730	91	1826.	1		1345	166	14.	1		2000	241	0.
1		0120	17	0.	1		0735	92	1784.	1		1350	167	13.	1		2005	242	0.
1		0125	18	0.	1		0740	93	1742.	1		1355	168	12.	1		2010	243	0.
1		0130	19	0.	1		0745	94	1701.	1		1400	169	11.	1		2015	244	0.
1		0135	20	0.	1		0750	95	1660.	1		1405	170	10.	1		2020	245	0.
1		0140	21	0.	1		0755	96	1620.	1		1410	171	9.	1		2025	246	0.
1		0145	22	0.	1		0800	97	1580.	1		1415	172	9.	1		2030	247	0.
1		0150	23	0.	1		0805	98	1542.	1		1420	173	8.	1		2035	248	0.
1		0155	24	0.	1		0810	99	1504.	1		1425	174	7.	1		2040	249	0.
1		0200	25	0.	1		0815	100	1468.	1		1430	175	7.	1		2045	250	0.
1		0205	26	0.	1		0820	101	1432.	1		1435	176	6.	1		2050	251	0.
1		0210	27	0.	1		0825	102	1396.	1		1440	177	6.	1		2055	252	0.
1		0215	28	0.	1		0830	103	1358.	1		1445	178	5.	1		2100	253	0.
1		0220	29	1.	1		0835	104	1320.	1		1450	179	5.	1		2105	254	0.
1		0225	30	1.	1		0840	105	1283.	1		1455	180	5.	1		2110	255	0.
1		0230	31	2.	1		0845	106	1246.	1		1500	181	4.	1		2115	256	0.
1		0235	32	3.	1		0850	107	1211.	1		1505	182	4.	1		2120	257	0.
1		0240	33	5.	1		0855	108	1176.	1		1510	183	4.	1		2125	258	0.
1		0245	34	7.	1		0900	109	1142.	1		1515	184	3.	1		2130	259	0.
1		0250	35	9.	1		0905	110	1108.	1		1520	185	3.	1		2135	260	0.
1		0255	36	12.	1		0910	111	1074.	1		1525	186	3.	1		2140	261	0.
1		0300	37	15.	1		0915	112	1038.	1		1530	187	3.	1		2145	262	0.
1		0305	38	20.	1		0920	113	1002.	1		1535	188	2.	1		2150	263	0.
1		0310	39	26.	1		0925	114	966.	1		1540	189	2.	1		2155	264	0.
1		0315	40	35.	1		0930	115	932.	1		1545	190	2.	1		2200	265	0.
1		0320	41	49.	1		0935	116	898.	1		1550	191	2.	1		2205	266	0.
1		0325	42	70.	1		0940	117	866.	1		1555	192	2.	1		2210	267	0.
1		0330	43	103.	1		0945	118	834.	1		1600	193	2.	1		2215	268	0.
1		0335	44	152.	1		0950	119	802.	1		1605	194	2.	1		2220	269	0.
1		0340	45	232.	1		0955	120	769.	1		1610	195	1.	1		2225	270	0.
1		0345	46	347.	1		1000	121	734.	1		1615	196	1.	1		2230	271	0.
1		0350	47	489.	1		1005	122	699.	1		1620	197	1.	1		2235	272	0.
1		0355	48	658.	1		1010	123	664.	1		1625	198	1.	1		2240	273	0.
1		0400	49	842.	1		1015	124	631.	1		1630	199	1.	1		2245	274	0.
1		0405	50	1016.	1		1020	125	600.	1		1635	200	1.	1		2250	275	0.
1		0410	51	1169.	1		1025	126	570.	1		1640	201	1.	1		2255	276	0.
1		0415	52	1298.	1		1030	127	541.	1		1645	202	1.	1		2300	277	0.
1		0420	53	1405.	1		1035	128	511.	1		1650	203	1.	1		2305	278	0.
1		0425	54	1480.	1		1040	129	479.	1		1655	204	1.	1		2310	279	0.
1		0430	55	1518.	1		1045	130	445.	1		1700	205	1.	1		2315	280	0.
1		0435	56	1537.	1		1050	131	409.	1		1705	206	1.	1		2320	281	0.
1		0440	57	1557.	1		1055	132	375.	1		1710	207	1.	1		2325	282	0.
1		0445	58	1584.	1		1100	133	345.	1		1715	208	1.	1		2330	283	0.
1		0450	59	1625.	1		1105	134	317.	1		1720	209	0.	1		2335	284	0.
1		0455	60	1701.	1		1110	135	293.	1		1725	210	0.	1		2340	285	0.
1		0500	61	1838.	1		1115	136	270.	1		1730	211	0.	1		2345	286	0.
1		0505	62	2014.	1		1120	137	249.	1		1735	212	0.	1		2350	287	0.
1		0510	63	2181.	1		1125	138	229.	1		1740	213	0.	1		2355	288	0.
1		0515	64	2319.	1		1130	139	208.	1		1745	214	0.	2		0000	289	0.
1		0520	65	2432.	1		1135	140	185.	1		1750	215	0.	2		0005	290	0.

1	0525	66	2517.	*	1	1140	141	159.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	2570.	*	1	1145	142	134.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	2594.	*	1	1150	143	113.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	2598.	*	1	1155	144	96.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	2587.	*	1	1200	145	82.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	2561.	*	1	1205	146	71.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	2526.	*	1	1210	147	63.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	2487.	*	1	1215	148	56.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	2449.	*	1	1220	149	50.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	2413.	*	1	1225	150	45.	*	1	1840	225	0.	*	2	0055	300	0.
				*					*					*				

****

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)				
		(CFS)			
+ 2598.	5.67	1710.	471.	454.	454.
		(INCHES) .179	.197	.197	.197
		(AC-FT) 848.	934.	934.	934.

CUMULATIVE AREA = 88.86 SQ MI

COMPUTED MUSKINGUM-CUNGE PARAMETERS

ELEMENT	ALPHA	M	COMPUTATION TIME STEP DT (MIN)	DX (FT)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	MAXIMUM CELERITY (FPS)
MAIN	.08	1.64	5.00	500.00	560.76	420.00	.04	3.17

INTERPOLATED TO SPECIFIED COMPUTATION INTERVAL

MAIN	.08	1.64	5.00		560.76	420.00	.04

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1851E+03 EXCESS= .0000E+00 OUTFLOW= .1851E+03 BASIN STORAGE= .1121E-01 PERCENT ERROR= .0

****

HYDROGRAPH AT STATION FINISH
PLAN 1, RATIO = .26

****

DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	*	1		0615	76	510.	*	1		1230	151	22.	*	1		1845	226	0.
1		0005	2	0.	*	1		0620	77	526.	*	1		1235	152	21.	*	1		1850	227	0.
1		0010	3	0.	*	1		0625	78	509.	*	1		1240	153	20.	*	1		1855	228	0.
1		0015	4	0.	*	1		0630	79	525.	*	1		1245	154	18.	*	1		1900	229	0.
1		0020	5	0.	*	1		0635	80	540.	*	1		1250	155	17.	*	1		1905	230	0.
1		0025	6	0.	*	1		0640	81	533.	*	1		1255	156	16.	*	1		1910	231	0.
1		0030	7	0.	*	1		0645	82	544.	*	1		1300	157	15.	*	1		1915	232	0.
1		0035	8	0.	*	1		0650	83	552.	*	1		1305	158	14.	*	1		1920	233	0.
1		0040	9	0.	*	1		0655	84	551.	*	1		1310	159	14.	*	1		1925	234	0.
1		0045	10	0.	*	1		0700	85	561.	*	1		1315	160	13.	*	1		1930	235	0.
1		0050	11	0.	*	1		0705	86	558.	*	1		1320	161	12.	*	1		1935	236	0.
1		0055	12	0.	*	1		0710	87	554.	*	1		1325	162	11.	*	1		1940	237	0.
1		0100	13	0.	*	1		0715	88	549.	*	1		1330	163	11.	*	1		1945	238	0.
1		0105	14	0.	*	1		0720	89	537.	*	1		1335	164	10.	*	1		1950	239	0.
1		0110	15	0.	*	1		0725	90	526.	*	1		1340	165	10.	*	1		1955	240	0.
1		0115	16	0.	*	1		0730	91	512.	*	1		1345	166	9.	*	1		2000	241	0.
1		0120	17	0.	*	1		0735	92	498.	*	1		1350	167	9.	*	1		2005	242	0.
1		0125	18	0.	*	1		0740	93	481.	*	1		1355	168	8.	*	1		2010	243	0.
1		0130	19	0.	*	1		0745	94	466.	*	1		1400	169	8.	*	1		2015	244	0.
1		0135	20	0.	*	1		0750	95	449.	*	1		1405	170	7.	*	1		2020	245	0.
1		0140	21	0.	*	1		0755	96	432.	*	1		1410	171	7.	*	1		2025	246	0.
1		0145	22	0.	*	1		0800	97	415.	*	1		1415	172	6.	*	1		2030	247	0.
1		0150	23	0.	*	1		0805	98	398.	*	1		1420	173	6.	*	1		2035	248	0.
1		0155	24	0.	*	1		0810	99	381.	*	1		1425	174	6.	*	1		2040	249	0.
1		0200	25	0.	*	1		0815	100	365.	*	1		1430	175	6.	*	1		2045	250	0.
1		0205	26	0.	*	1		0820	101	350.	*	1		1435	176	5.	*	1		2050	251	0.
1		0210	27	0.	*	1		0825	102	335.	*	1		1440	177	5.	*	1		2055	252	0.
1		0215	28	0.	*	1		0830	103	320.	*	1		1445	178	5.	*	1		2100	253	0.
1		0220	29	0.	*	1		0835	104	306.	*	1		1450	179	5.	*	1		2105	254	0.
1		0225	30	0.	*	1		0840	105	293.	*	1		1455	180	4.	*	1		2110	255	0.

1	0230	31	0.	*	1	0845	106	279.	*	1	1500	181	4.	*	1	2115	256	0.
1	0235	32	0.	*	1	0850	107	266.	*	1	1505	182	4.	*	1	2120	257	0.
1	0240	33	0.	*	1	0855	108	253.	*	1	1510	183	4.	*	1	2125	258	0.
1	0245	34	0.	*	1	0900	109	241.	*	1	1515	184	4.	*	1	2130	259	0.
1	0250	35	0.	*	1	0905	110	229.	*	1	1520	185	4.	*	1	2135	260	0.
1	0255	36	0.	*	1	0910	111	217.	*	1	1525	186	3.	*	1	2140	261	0.
1	0300	37	0.	*	1	0915	112	204.	*	1	1530	187	3.	*	1	2145	262	0.
1	0305	38	0.	*	1	0920	113	189.	*	1	1535	188	3.	*	1	2150	263	0.
1	0310	39	0.	*	1	0925	114	173.	*	1	1540	189	3.	*	1	2155	264	0.
1	0315	40	0.	*	1	0930	115	158.	*	1	1545	190	3.	*	1	2200	265	0.
1	0320	41	0.	*	1	0935	116	146.	*	1	1550	191	3.	*	1	2205	266	0.
1	0325	42	0.	*	1	0940	117	136.	*	1	1555	192	3.	*	1	2210	267	0.
1	0330	43	0.	*	1	0945	118	127.	*	1	1600	193	2.	*	1	2215	268	0.
1	0335	44	0.	*	1	0950	119	119.	*	1	1605	194	2.	*	1	2220	269	0.
1	0340	45	2.	*	1	0955	120	112.	*	1	1610	195	2.	*	1	2225	270	0.
1	0345	46	5.	*	1	1000	121	107.	*	1	1615	196	2.	*	1	2230	271	0.
1	0350	47	12.	*	1	1005	122	102.	*	1	1620	197	2.	*	1	2235	272	0.
1	0355	48	23.	*	1	1010	123	98.	*	1	1625	198	2.	*	1	2240	273	0.
1	0400	49	39.	*	1	1015	124	93.	*	1	1630	199	2.	*	1	2245	274	0.
1	0405	50	64.	*	1	1020	125	89.	*	1	1635	200	2.	*	1	2250	275	0.
1	0410	51	97.	*	1	1025	126	85.	*	1	1640	201	2.	*	1	2255	276	0.
1	0415	52	127.	*	1	1030	127	81.	*	1	1645	202	1.	*	1	2300	277	0.
1	0420	53	154.	*	1	1035	128	78.	*	1	1650	203	1.	*	1	2305	278	0.
1	0425	54	179.	*	1	1040	129	74.	*	1	1655	204	1.	*	1	2310	279	0.
1	0430	55	200.	*	1	1045	130	71.	*	1	1700	205	1.	*	1	2315	280	0.
1	0435	56	219.	*	1	1050	131	67.	*	1	1705	206	1.	*	1	2320	281	0.
1	0440	57	235.	*	1	1055	132	64.	*	1	1710	207	1.	*	1	2325	282	0.
1	0445	58	247.	*	1	1100	133	61.	*	1	1715	208	1.	*	1	2330	283	0.
1	0450	59	256.	*	1	1105	134	58.	*	1	1720	209	1.	*	1	2335	284	0.
1	0455	60	265.	*	1	1110	135	56.	*	1	1725	210	1.	*	1	2340	285	0.
1	0500	61	278.	*	1	1115	136	53.	*	1	1730	211	1.	*	1	2345	286	0.
1	0505	62	296.	*	1	1120	137	51.	*	1	1735	212	1.	*	1	2350	287	0.
1	0510	63	319.	*	1	1125	138	49.	*	1	1740	213	1.	*	1	2355	288	0.
1	0515	64	343.	*	1	1130	139	46.	*	1	1745	214	1.	*	2	0000	289	0.
1	0520	65	366.	*	1	1135	140	43.	*	1	1750	215	1.	*	2	0005	290	0.
1	0525	66	385.	*	1	1140	141	41.	*	1	1755	216	1.	*	2	0010	291	0.
1	0530	67	401.	*	1	1145	142	39.	*	1	1800	217	1.	*	2	0015	292	0.
1	0535	68	411.	*	1	1150	143	36.	*	1	1805	218	1.	*	2	0020	293	0.
1	0540	69	418.	*	1	1155	144	34.	*	1	1810	219	1.	*	2	0025	294	0.
1	0545	70	418.	*	1	1200	145	32.	*	1	1815	220	1.	*	2	0030	295	0.
1	0550	71	410.	*	1	1205	146	30.	*	1	1820	221	1.	*	2	0035	296	0.
1	0555	72	399.	*	1	1210	147	28.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	391.	*	1	1215	148	27.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	401.	*	1	1220	149	25.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	447.	*	1	1225	150	24.	*	1	1840	225	0.	*	2	0055	300	0.

****

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 561.	7.00		344.	93.	90.	90.
		(INCHES)	.036	.039	.039	.039
		(AC-FT)	171.	185.	185.	185.

CUMULATIVE AREA = 88.86 SQ MI

APPENDIX D
STREAMBANK EROSION FOR SPECIFIC STORM EVENTS

Upstream Reach

Event Frequency

Alternative	100 Yr	50 Yr	25 Yr	10 Yr	5 Yr	2 Yr	Annual
	(kg/yr)						
Baseline	6.23E+04	1.02E+05	1.36E+05	1.56E+05	1.21E+05	2.88E+04	6.07E+05
Alternative A	6.97E+04	1.03E+05	1.37E+05	1.58E+05	1.23E+05	2.86E+04	6.20E+05
Alternative B	7.29E+04	1.09E+05	1.47E+05	1.76E+05	1.44E+05	4.47E+04	6.93E+05
Alternative C	7.80E+04	1.19E+05	1.64E+05	2.06E+05	1.80E+05	6.09E+04	8.08E+05
Alternative D	7.99E+04	1.22E+05	1.71E+05	2.18E+05	1.95E+05	6.98E+04	8.54E+05
Alternative E	8.16E+04	1.25E+05	1.76E+05	2.28E+05	2.08E+05	7.92E+04	8.97E+05
No-Action	8.41E+04	1.30E+05	1.85E+05	2.45E+05	2.29E+05	1.00E+05	9.73E+05

Downstream Reach

Event Frequency

Alternative	100 Yr	50 Yr	25 Yr	10 Yr	5 Yr	2 Yr	Annual
	(kg/yr)						
Baseline	4.16E+04	6.69E+04	9.79E+04	1.31E+05	9.08E+04	1.27E+05	3.01E+05
Alternative A	4.19E+04	6.69E+04	9.94E+04	1.33E+05	8.82E+04	1.19E+05	3.11E+05
Alternative B	4.37E+04	7.04E+04	1.04E+05	1.45E+05	1.08E+05	1.22E+05	3.49E+05
Alternative C	4.39E+04	7.35E+04	1.10E+05	1.56E+05	1.38E+05	7.36E+04	4.47E+05
Alternative D	4.41E+04	7.43E+04	1.12E+05	1.63E+05	1.46E+05	6.55E+04	4.73E+05
Alternative E	4.43E+04	7.51E+04	1.14E+05	1.67E+05	1.51E+05	3.73E+04	5.13E+05
No-Action	4.44E+04	7.68E+04	1.17E+05	1.72E+05	1.62E+05	2.25E+04	5.49E+05

Appendix M

VISUAL RESOURCES

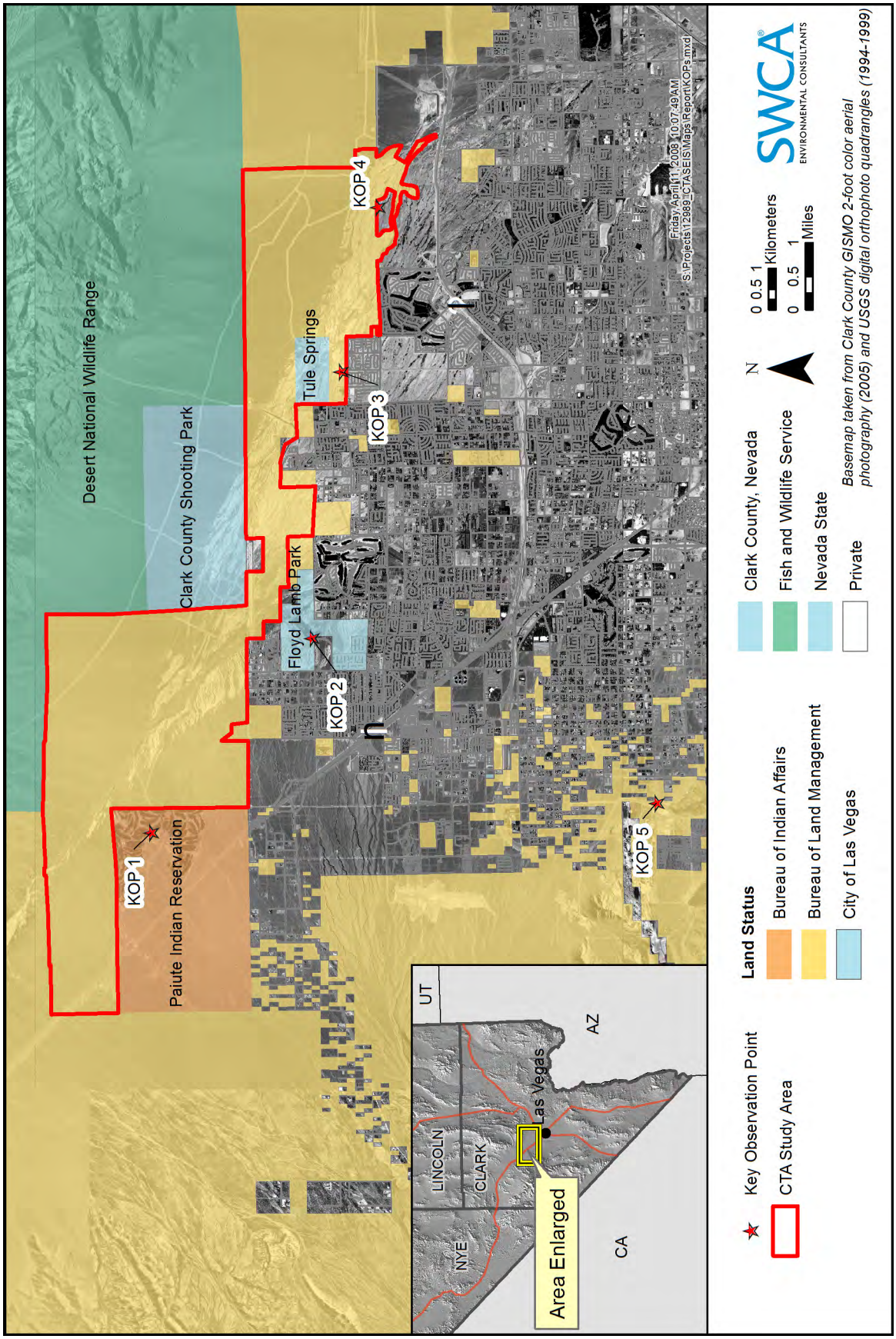

Figure M.1-1. Visual Resources—Key Observation Points (KOPs).

Form 8400-4
(September 1985)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date (of fieldwork): February 27, 2008
District: Las Vegas Field Office
Resource Area:
Activity (program): Lands and Realty, 1430

SECTION A. PROJECT INFORMATION

1. Project Name Upper Las Vegas Wash CTA SEIS
Urban development; Thunderbird electric trans. line

2. Key Observation Point (KOP)
Paiute Reservation Golf Club House – KOP 1

3. VRM Class
Class III

4. Location
Township(s) 18 S
Range(s) 60 E
Section(s) 19–21; 28–30

5. Location Sketch
See the attached map for location of the KOP (Figure L.1-1). The attached photo is a simulation of the proposed development, as seen from the KOP.

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Gently sloping bajada in MG. Rugged mountains in BG. Golf course in FG (not in CTA).	Bajada – continuous carpet of vegetation; few clumpy joshua trees. Vegetation cover on mountains not distinguishable. Golf course fairways – continuous carpet.	Electric power poles in MG.
LINE	Undulating horizontal line on horizon of mountain range. Horizontal layers in mountain range. Diagonal lines of side washes. Rolling fairways.	Joshua trees in FG – vertical. No characteristic lines in vegetation cover on the bajada.	Power poles – vertical.
COLOR	Bajadas – tans and buff colors. Mountains – tan with black layers. LV Wash – tan. Lake – very blue.	Bajada – olive green shrubs, gray grasses. Golf course fairways – lawn green.	Power poles – black.
TEX-TURE	Bajada – smooth; mountains – rough. LV Wash – moderate. Golf course – smooth. Lake – smooth.	Bajada – moderately dense, continuous; almost smooth. Golf course fairways – smooth.	Power poles – smooth.

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Leveling, terracing of bajadas; stair-stepping of bajada.	Patchy urban landscaping between residential and commercial buildings.	Blocky square and rectangular buildings. Vertical electrical power poles, street lights, etc.
LINE	Multiple horizontal lines created by leveling of the land form.	Vertical lines of landscaping trees.	Vertical and horizontal lines of buildings. Curvilinear and straight lines of roads. Vertical lines of electrical poles.
COLOR	Black asphalt and gray concrete of roads. Natural buffs, tans, and gray of undisturbed land form. Urban landscaping.	Various greens of urban landscaping.	Various colors of buildings. Gray and dark colors for power poles. Black asphalt; gray concrete.
TEX-TURE	Smooth to medium.	Smooth lawns to medium shrubs and trees.	Mostly smooth.

SECTION D. CONTRAST RATING ☐ **SHORT TERM** ☒ **LONG TERM**

1. **DEGREE OF CONTRAST**

2. Does project design meet visual resource management objectives? ☒ Yes ☒ No (Explain on reverse side)

3. Additional mitigating measures recommended? ☐ Yes ☒ No (Explain on reverse side)

Evaluators Name(s) Steve Knox– SWCA, Inc.
Date March 19, 2008

	FEATURES											
	LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)			
	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
ELEMENTS: Form		X			X				X			
ELEMENTS: Line		X				X			X			
ELEMENTS: Color		X			X				X			
ELEMENTS: Texture			X			X					X	

SECTION D. (Continued)

Comments from Item 2.

CTA – The roads crossing the CTA would introduce curvilinear lines into the landscape that would be visible. While visible to the average visitor, these roads across the Upper Las Vegas Wash would not dominate the landscape of the CTA. The wash zone landscape and lower slopes of the adjacent bajadas would generally still remain in an undeveloped condition and the natural landform and vegetation community would still predominate in the setting.

Outside the CTA – Lands on the bajadas above the wash zone would be made available for disposal and developed for urban uses, including residential neighborhoods, commercial businesses, light industrial uses, schools and other public buildings, and parks. This development would include roads, utilities, and landscaping. Further, the Thunderbird powerline would traverse the perimeter of the urban development. This degree of development on the slopes adjacent to the wash zone would transform the natural landscape to an urban landscape. This transformation would dominate the scene, and would not be consistent with BLM objectives for VRM Class III management objectives. However, when the lands are transferred out of public ownership, these public land objectives will no longer apply to those lands.

Additional Mitigation Measures (See Item 3)

No additional mitigating measures are proposed for the lands that would be developed for the growth of Las Vegas.

U. S. GOVERNMENT PRINTING OFFICE: 1985-461-988/33094

Form 8400-4
(September 1985)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date (of fieldwork): February 27, 2008
District: Las Vegas Field Office
Resource Area:
Activity (program): Lands and Realty–1430

SECTION A. PROJECT INFORMATION

1. Project Name Upper Las Vegas Wash CTA SEIS
Urban development; Thunderbird electric trans. line

2. Key Observation Point (KOP)
Floyd Lamb Park – KOP 2

3. VRM Class
Class III

4. Location
Township(s) 18 S
Range(s) 60 E
Section(s) 19–21, 28–29

5. Location Sketch
See the attached map for location of the KOP (Figure L.1-1). The attached photo is a simulation of the proposed development, as seen from the KOP.

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Gently sloping bajada in MG; rugged mountains in BG; small hills and mesas in FG. Road and parking area in FG.	Bajada – continuous carpet of vegetation in MG. Urban landscaping trees, shrubs, and grasses in FG. BG vegetation not distinguishable.	Vertical power poles; blocky houses; rectangular fence.
LINE	Undulating horizontal line on horizon of mountain range. Horizontal layers in mountain range. Diagonal and horizontal lines in mesa of FG.	No distinct line in MG vegetation. FG vegetation vertical.	Vertical and horizontal lines of power poles and fence. Horizontal and vertical lines of houses, with some diagonal roof lines.
COLOR	Bajada – tans and buff colors. Mountains – tans with black layers. FG hills and mesa – tans. Black road and parking area.	Bajada – olive green shrubs, gray grasses. FG – dark green trees, yellow grasses, yellow/green shrubs (winter time colors).	Gray power poles; white fence; white and tan houses.
TEX-TURE	Bajada – smooth; mountains – rough; FG hills and mesa – smooth. FG road and parking area – smooth.	Bajada – moderately dense, continuous, almost smooth. FG park vegetation – rough.	Power poles and fence – smooth. Houses – medium.

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Leveling, terracing of bajadas; stair-stepping of bajada.	Patchy urban landscaping between residential and commercial buildings.	Blocky square and rectangular buildings. Vertical electrical power poles, street lights, etc.
LINE	Multiple horizontal lines created by leveling of the land form.	Vertical lines of landscaping trees.	Vertical and horizontal lines of buildings. Curvilinear and straight lines of roads. Vertical lines of electrical poles.
COLOR	Black asphalts, gray concretes of roads. Natural buffs, tans, and grays of undisturbed lands. Urban landscaping.	Various greens of urban landscaping.	Various colors of buildings. Gray and dark colors of power poles. Black asphalt; gray concrete.
TEX-TURE	Smooth to medium.	Smooth lawns to medium shrubs and trees.	Mostly smooth.

SECTION D. CONTRAST RATING ☐ **SHORT TERM** ☒ **LONG TERM**

1. DEGREE OF CONTRAST

ELEMENTS	FEATURES: LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)			
	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Form		X			X						X	
Line		X				X					X	
Color		X			X						X	
Texture			X			X					X	

2. Does project design meet visual resource management objectives? ☐ Yes ☒ No (Explain on reverse side)

3. Additional mitigating measures recommended? ☐ Yes ☒ No (Explain on reverse side)

Evaluators Name(s) Steve Knox–SWCA, Inc.
Date March 19, 2008

SECTION D. (Continued)

Comments from Item 2.

Outside the CTA – Development of the bajada across Las Vegas Wash as seen from this KOP would transform the landscape from an undeveloped and natural middle ground landscape to an urban setting composed of residential areas, businesses, and light industrial development. This transformation would dominate the view and would not be consistent with BLM's VRM Class III objectives. However, when the lands are transferred out of public ownership, these public land objectives will no longer apply to those lands. Further, from this KOP, the view of urban growth would be seen as an extension of identical development that currently exists in the foreground of the landscape, repeating the form, line, color, and texture of that development. The Thunderbird electric transmission line would repeat the line and texture of the existing power poles that rise above the urban development in the foreground. Urban (residential and park) landscaping would repeat the form, line, color, and texture of the exiting urban vegetation at Floyd Lamb Park.

Additional Mitigation Measures (See Item 3)

No additional mitigating measures are proposed for the lands that would be developed for the growth of Las Vegas.

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Form 8400-4
(September 1985)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date (of fieldwork): February 27, 2008
District: Las Vegas Field Office
Resource Area:
Activity (program): Lands and Realty–1430

SECTION A. PROJECT INFORMATION

1. Project Name Upper Las Vegas Wash CTA SEIS
Urban development; Sheep Mountain Parkway

2. Key Observation Point (KOP)
McCool Regional Park – KOP 3

3. VRM Class
Class III

4. Location
Township(s) 19 S
Range(s) 61 E
Section(s) 2–6, 9–11

5. Location Sketch
See the attached map for location of the KOP (Figure L.1-1). The attached photo is a simulation of the proposed development, as seen from the KOP.

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Gently sloping bajada in MG; rugged mountains in BG; flat airport runway in FG.	Bajada – continuous carpet of vegetation. Vegetation on mountains not distinguishable. Scattered, clumpy shrubs in FG.	Power poles.
LINE	Undulating horizontal line on horizon of mountain range. Horizontal layers in mountains.	No characteristic line in the vegetation.	Vertical power poles.
COLOR	Bajada – tans and buff colors. Mountains – tan with black layers. Light tan/white soils and black asphalt in FG.	Bajada – olive green shrubs, gray grasses. FG shrubs – gray and olive green.	Light gray power poles.
TEX-TURE	Bajada – smooth; mountains – rough; FG – smooth to medium.	Bajada – moderately dense, continuous, almost smooth. FG medium.	Smooth power poles.

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Leveling, terracing of bajadas; stair-stepping of bajada.	Patchy urban landscaping between residential and commercial buildings, and of public use area of Sheep Mtn. Parkway.	Blocky square and rectangular buildings. Vertical electrical power poles, street lights, etc.
LINE	Multiple horizontal lines created by leveling of the land form.	Vertical lines of landscaping trees.	Vertical and horizontal lines of buildings. Curvilinear and straight lines of roads. Vertical lines of electrical poles. Horizontal line of cut slope of Sheep Mountain Parkway.
COLOR	Black asphalts, gray concretes of roads. Natural buffs, tans, and grays of undisturbed lands. Urban landscaping.	Various greens of urban landscaping.	Various colors of buildings. Gray and dark colors of power poles. Black asphalt, gray concrete of roads.
TEX-TURE	Smooth to medium.	Smooth lawns to medium shrubs and trees.	Power poles – smooth. Buildings – medium.

SECTION D. CONTRAST RATING ☐ **SHORT TERM** ☒ **LONG TERM**

1. DEGREE OF CONTRAST

ELEMENTS	FEATURES: LAND/WATER BODY (1) Strong	Moderate	Weak	None	VEGETATION (2) Strong	Moderate	Weak	None	STRUCTURES (3) Strong	Moderate	Weak	None
Form		X			X				X			
Line		X				X			X			
Color		X			X				X			
Texture			X			X					X	

2. Does project design meet visual resource management objectives? ☐ Yes ☒ No (Explain on reverse side)

3. Additional mitigating measures recommended? ☒ Yes ☐ No (Explain on reverse side)

Evaluators Name(s) Steve Knox–SWCA, Inc.
Date March 19, 2008

SECTION D. (Continued)

Comments from Item 2.

Outside the CTA – Lands on the bajadas beyond Las Vegas Wash would be made available for disposal and developed for urban uses, including residential neighborhoods, commercial businesses, light industrial uses, schools and other public buildings, and parks. This development would include roads, utilities, and landscaping. Further, the Thunderbird powerline would traverse the perimeter of the urban development. And, the Sheep Mountain Parkway would be constructed around most of the future urban development. The proposed degree of development would transform a natural, and mostly undeveloped, landscape to an urban landscape. While mitigation would help reduce some of the contrast to the landscape, this transformation would dominate the scene and would not be consistent with BLM objectives for VRM Class III management objectives. However, when the lands are transferred out of public ownership, these public land objectives will no longer apply to those lands.

Additional Mitigation Measures (See Item 3)

1. Reshape and re-contour the cut slope (up slope side) of the excavation for the Sheep Mountain Parkway and re-vegetate by planting to reduce the visual impact of the horizontal line on the landscape.

2. Paint power poles a color that blends with the background landform and vegetation colors to reduce the visual impact of the vertical poles on the landscape.

U. S. GOVERNMENT PRINTING OFFICE: 1985-461-988/33094

Form 8400-4
(September 1985)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date (of fieldwork): February 27, 2008
District: Las Vegas Field Office
Resource Area:
Activity (program): Lands and Realty–1430

SECTION A. PROJECT INFORMATION

1. Project Name Upper Las Vegas Wash CTA SEIS
Urban development; Sheep Mountain Parkway

2. Key Observation Point (KOP)
Grand Teton Drive at Eglington Preserve – KOP 4

3. VRM Class
Class III

4. Location
Township(s) 19 S
Range(s) 61 E
Section(s) 2–6, 9–11

5. Location Sketch
See the attached map for location of the KOP (Figure L.1-1). The attached photo is a simulation of the proposed development, as seen from the KOP.

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Gently sloping bajada in MG; rugged mountains in BG. Flat dirt road in FG.	Bajada – continuous carpet of vegetation. Vegetation on mountains not distinguishable. Scattered, clumpy shrubs in FG.	Power poles. Rectangular, blocky wall.
LINE	Undulating horizontal line on horizon of mountain range. Horizontal layers in mountains.	No characteristic lines in the vegetation.	Vertical power poles. Horizontal line of brick wall.
COLOR	Bajada – tans and buff colors. Mountains – tan with black layers. FG – light tans and white soils.	Bajada – olive green shrubs, gray grasses. FG shrubs – gray and olive green.	Light gray power poles. Tan brick wall.
TEX-TURE	Bajada – smooth; mountains – rough. FG cobbly – medium.	Bajada – moderately dense, continuous, almost smooth. FG medium.	Smooth

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Leveling, terracing of bajadas; stair-stepping of bajada.	Patchy urban landscaping between residential and commercial buildings, and of public use area of Sheep Mtn. Parkway.	Blocky square and rectangular buildings. Vertical electrical power poles, street lights, etc.
LINE	Multiple horizontal lines created by leveling of the landform.	Vertical lines of landscaping trees.	Vertical and horizontal lines of buildings. Curvilinear and straight lines of roads. Vertical lines of electrical poles. Horizontal line of cut slope of the Sheep Mountain Parkway.
COLOR	Black asphalts, gray concretes of roads. Natural buffs, tans, and grays of undisturbed or undeveloped lands.	Various greens of urban landscaping.	Various colors of buildings. Gray and dark colors of power poles. Black asphalt, gray concrete of roads.
TEX-TURE	Smooth to medium.	Smooth lawns to medium shrubs and trees.	Power poles – smooth; buildings – medium.

SECTION D. CONTRAST RATING ☐ **SHORT TERM** ☒ **LONG TERM**

1. DEGREE OF CONTRAST

ELEMENTS	FEATURES: LAND/WATER BODY (1) Strong	Moderate	Weak	None	VEGETATION (2) Strong	Moderate	Weak	None	STRUCTURES (3) Strong	Moderate	Weak	None
Form		X			X				X			
Line		X				X			X			
Color		X			X				X			
Texture			X			X				X		

2. Does project design meet visual resource management objectives? ☐ Yes ☒ No (Explain on reverse side)

3. Additional mitigating measures recommended? ☒ Yes ☐ No (Explain on reverse side)

Evaluators Name(s) Steve Knox–SWCA, Inc.
Date March 19, 2008

SECTION D. (Continued)

Comments from Item 2.

Outside the CTA – Lands on the bajadas beyond Las Vegas Wash would be made available for disposal and developed for urban uses, including residential neighborhoods, commercial businesses, light industrial uses, schools and other public buildings, and parks. This development would include roads, utilities, and landscaping. Further, the Thunderbird transmission line would traverse the perimeter of the urban development. And, the Sheep Mountain Parkway would be constructed around most of the future urban development. This proposed degree of development would transform a natural, and mostly undeveloped, landscape to an urban landscape. While mitigation would help reduce some of the contrast to the landscape, this transformation would dominate the scene and would not be consistent with BLM objectives for VRM Class III management objectives. However, when the lands are transferred out of public ownership, these public land objectives will no longer apply to those lands.

Additional Mitigation Measures (See Item 3)

1. Reshape and re-contour the cut slope (up slope side) of the excavation for the Sheep Mountain Parkway and re-vegetate by planting to reduce the visual impact of the horizontal line on the landscape.

2. Paint power poles a color that blends with the background landform and vegetation colors to reduce the visual contrast of the vertical poles on the landscape.

U. S. GOVERNMENT PRINTING OFFICE: 1985-461-988/33094

Form 8400-4
(September 1985)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date (of fieldwork): March 31, 2008
District: Las Vegas Field Office
Resource Area:
Activity (program): Lands and Realty–1430

SECTION A. PROJECT INFORMATION

1. Project Name Upper Las Vegas Wash CTA SEIS
Urban development, Sheep Mtn. Parkway, trans. line

2. Key Observation Point (KOP)
215 and Lone Mountain Road – KOP 5

3. VRM Class
Class III

4. Location
Township(s) 18 S
Range(s) 60 E
Section(s) 19–21, 28–33

5. Location Sketch
See the attached map for location of the KOP (Figure L.1-1). The attached photo is a simulation of the proposed development, as seen from the KOP.

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Gently sloping bajadas and rugged mountains in BG. Cities of Las Vegas and North Las Vegas in FG.	Vegetation cover of mountains and bajadas not distinguishable. Clumpy trees of urban landscaping in MG. Native shrubs and yuccas in FG.	Blocky square and rectangular buildings, rectangular signs, and electrical power poles in FG.
LINE	Undulating line of mountain range. Horizontal layers in mountain range. Horizontal line of LV Wash. Diagonal line of Decatur Rd. to shooting park.	Joshua trees in FG – vertical. No characteristic lines in vegetation cover in the city.	Electrical power poles – vertical. Signs and some buildings – vertical. Most building – horizontal, with some diagonal roof lines.
COLOR	Bajadas – tans and buff colors. Mountains – tan with black layers. LV Wash – light tans and white.	Bajada – olive green tint. Urban landscaping – dark greens. Native vegetation grays and light greens.	Power poles – gray and white. Buildings – earth tones. Signs – red, white, and black.
TEX-TURE	Bajada – smooth; mountains – moderate; City development – moderate to rough.	Bajada – moderately dense, continuous; almost smooth. Urban landscaping and native vegetation – rough.	All structures – mostly moderate texture. Rougher in FG.

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Leveling, terracing of bajadas; stair-stepping of bajada.	Patchy urban landscaping – mostly trees - between and rising above residential and commercial buildings	Blocky square and rectangular buildings. Vertical electrical power poles.
LINE	Multiple horizontal lines created by leveling of the land form.	No apparent line.	Multiple horizontal lines of continuous buildings. Horizontal line of Sheep Mountain Parkway. Vertical lines of electrical poles.
COLOR	Black asphalt and gray concrete of roads. Natural buffs, tans, and gray of undisturbed land form. Light colored road cuts and power line ROWs.	Various greens of urban landscaping. Darker greens most noticeable.	Various colors of buildings. Gray and light colors for power poles.
TEX-TURE	Smooth.	Moderate.	Smooth to moderate.

SECTION D. CONTRAST RATING ☐ SHORT TERM ☒ LONG TERM

1. **DEGREE OF CONTRAST**

	FEATURES											
	LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)			
	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
ELEMENTS: Form		X				X					X	
ELEMENTS: Line			X				X				X	
ELEMENTS: Color		X				X					X	
ELEMENTS: Texture			X			X				X		

2. Does project design meet visual resource management objectives? ☐ Yes ☒ No
(Explain on reverse side)

3. Additional mitigating measures recommended?
☐ Yes ☒ No (Explain on reverse side)

Evaluators Name(s) Steve Knox–SWCA, Inc.
Date April 1, 2008

SECTION D. (Continued)

Comments from Item 2.

CTA – Given the distance from the KOP to the CTA and adjacent lands and given the degree of urban development of lands outside but immediately adjacent to the CTA, it will be difficult to distinguish the lands within the CTA. Thus, it will be difficult to distinguish the developments that do occur in the CTA. The development of lands within the CTA will blend with adjacent urban development outside the CTA.

Outside the CTA – Distance will diminish the effect (view) of the anticipated urban development on the lands adjacent to the CTA, and it will be difficult to determine where the existing city development ends and the future development begins (following disposal of lands outside the CTA). Distance will soften the effect of development on the form, line, color, and texture of the land, vegetation, and structures. While it will be difficult to distinguish the effects of the new development and distance will reduce the effects of that development to moderate and weak ratings (see contrast rating above), the existing undeveloped landscape will still transform to dense urban development. That degree of development, even when viewed at a greater distance, is not consistent with BLM's VRM Class III objectives.

Additional Mitigation Measures (See Item 3)

No additional mitigating measures are proposed for the lands that would be developed for the growth of Las Vegas.

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Existing Landscape

Simulated Landscape

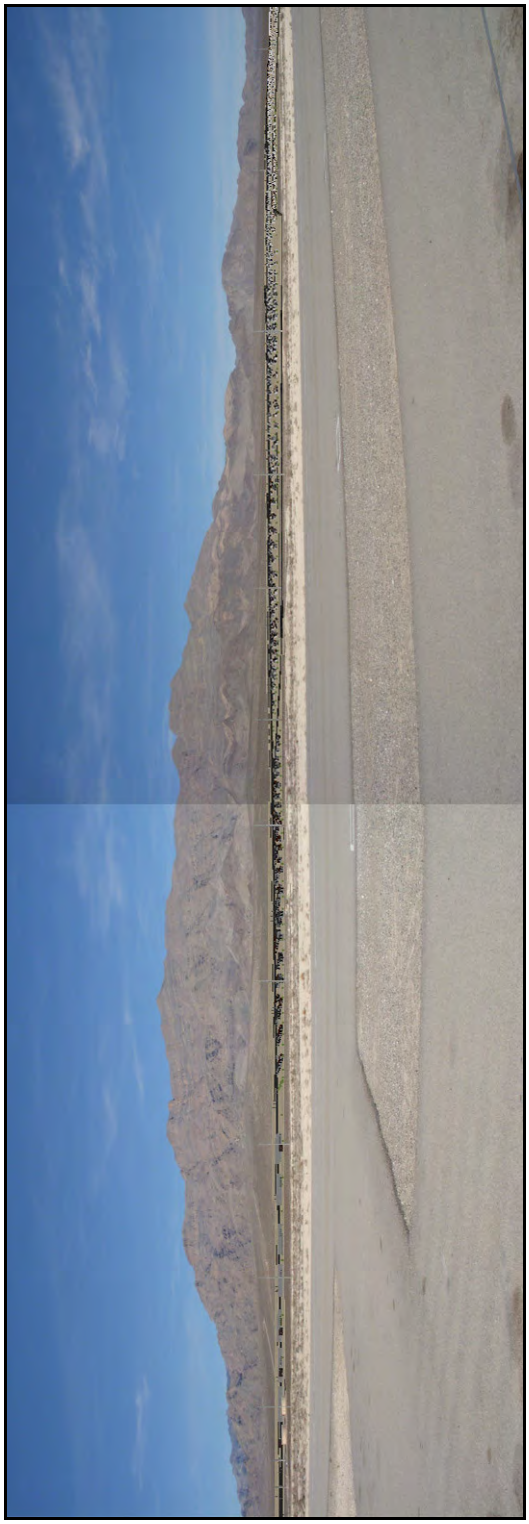
Figure M.1-2. Visual Simulation KOP 1.

Existing Landscape

Simulated Landscape

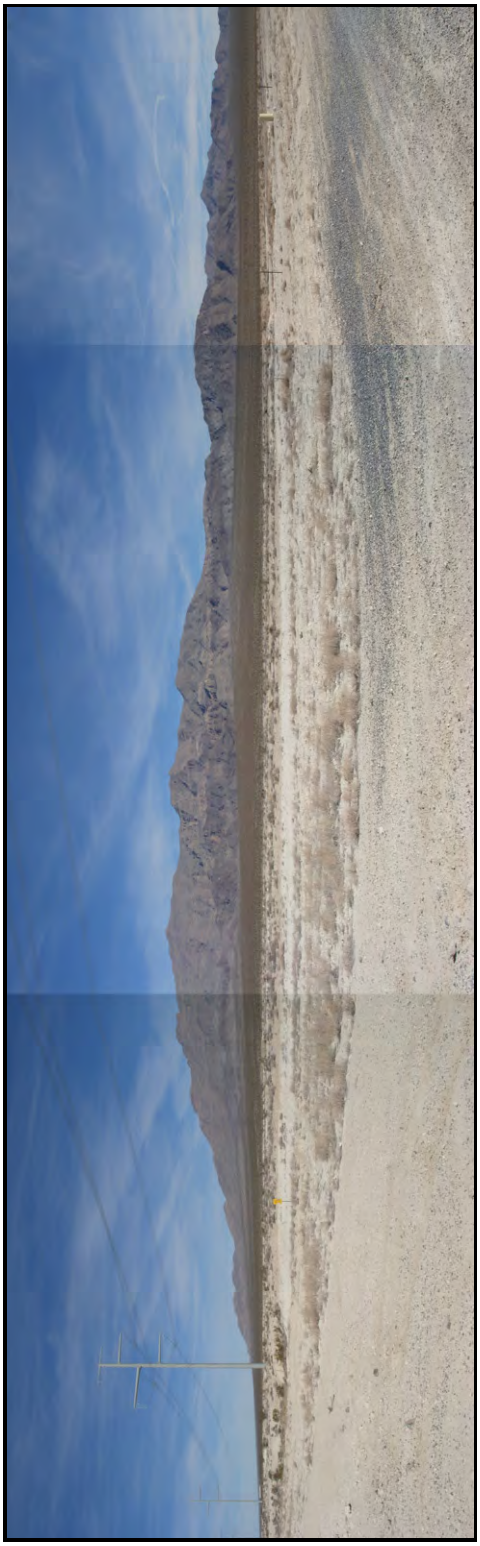
Figure M.1-3. Visual Simulation KOP 2.

Existing Landscape

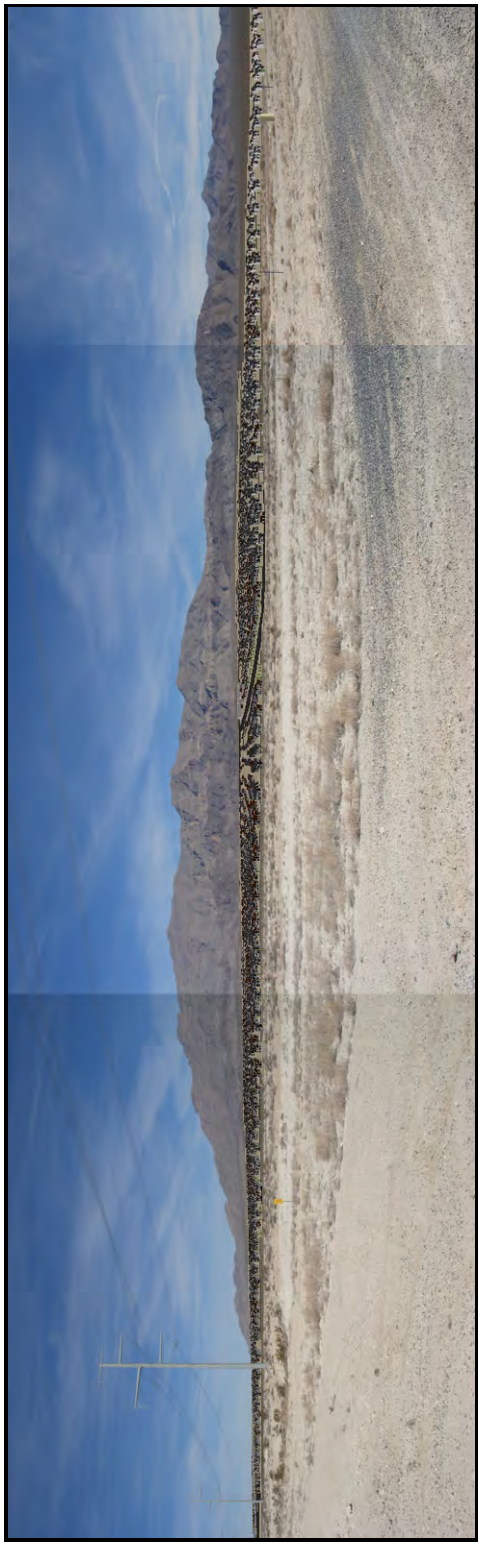


Simulated Landscape

Figure M.1-4. Visual Simulation KOP 3.



Existing Landscape



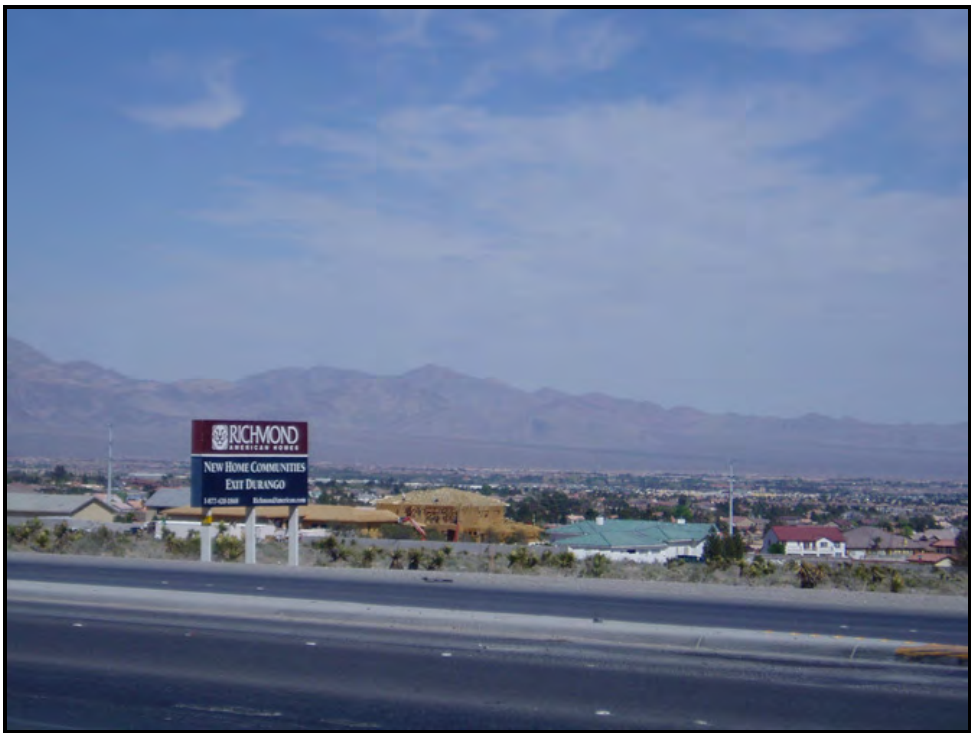
Simulated Landscape

Figure M.1-5. Visual Simulation KOP 4.

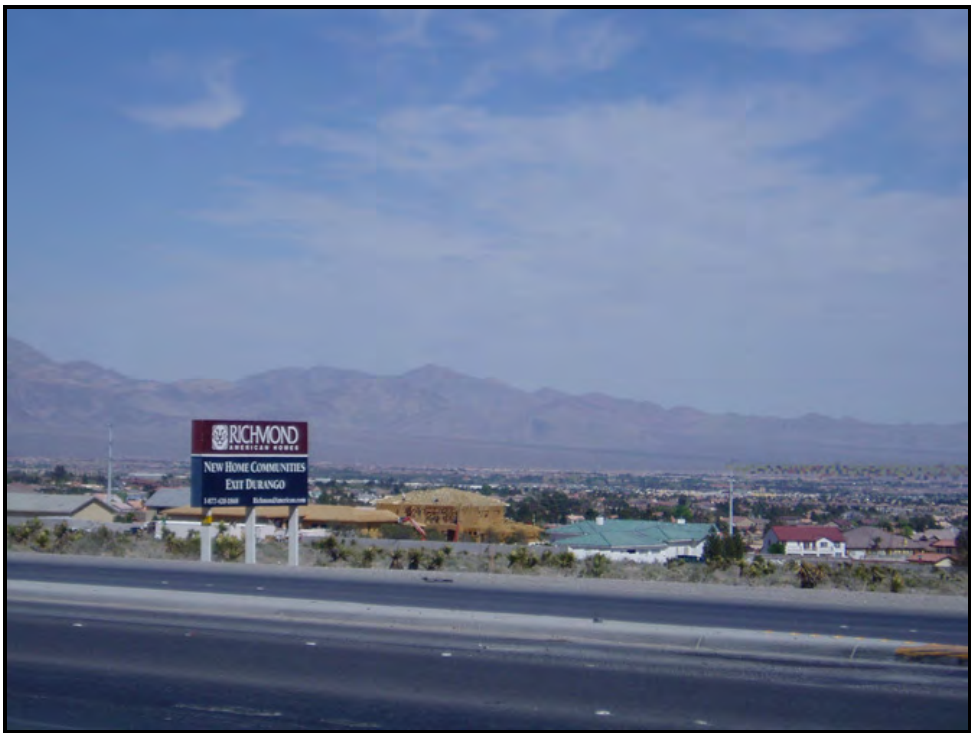
Existing Landscape

Simulated Landscape

Figure M.1-6a. Visual Simulation KOP 5.



Existing Landscape



Simulated Landscape

Figure M.1-6b. Visual Simulation KOP 5.

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Appendix N

COMMENT SUMMARY REPORT

UPPER LAS VEGAS WASH CONSERVATION TRANSFER AREA

DRAFT ENVIRONMENTAL IMPACT STATEMENT

COMMENT SUMMARY REPORT

Prepared for

Bureau of Land Management

Prepared by

SWCA Environmental Consultants
7373 Peak Drive, Suite 170
Las Vegas, NV 89128

September 2010

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APPENDIX

N–A. Detailed Comment Responses by Alternative

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PUBLIC COMMENT SUMMARY AND AGENCY RESPONSES

The main function of this appendix is to provide the Bureau of Land Management's (BLM's) response to comments received on the Draft Supplemental Environmental Impact Statement (SEIS). The appendix contains four main sections.

- Section N.1 provides a brief introduction and an overall summary of the process of soliciting, receiving, and evaluating comments on the Draft SEIS.
- Section N.2 provides instructions for finding specific comment letters, facsimiles, e-mails, and testimony (henceforth collectively referred to as comment letters) and agency responses to those letters in the CD that accompanies this document, as well as in subsequent sections of the appendix.
- Section N.3 contains a table of the respondent information for all unique comment letters received on the Draft SEIS. (Because of the volume of form letters received, identifying information for form letter respondents is contained in a spreadsheet on the CD.)
- Section N.4 contains a summary of substantive comments arranged by category or resource discipline, along with the agency response to each comment.

N.1 PUBLIC COMMENT PROCESS

The comments on the Draft SEIS that were used to prepare the Final SEIS were collected in accordance with the National Environmental Policy Act of 1969, as amended (NEPA), and a process established by Council on Environmental Quality (CEQ) regulations, which provide that agencies must "[m]ake diligent efforts to involve the public in . . . NEPA procedures" [40 Code of Federal Regulations (CFR) 1506.6(a)]. Although this appendix deals primarily with the comments received on the Draft SEIS, the reader should also be aware that public involvement preceded the release of the Draft DEIS, which included comments on the scope of issues that should be addressed in this Final SEIS document.

Preparation of the Draft SEIS that preceded this Final SEIS included soliciting comments from other agencies and the public to determine the scope of the document. NEPA requires that early public involvement in the SEIS process be used to identify issues and address any potentially significant concerns related to the Proposed Action. Public and agency involvement continued in various ways throughout this SEIS process. The purpose and need, identification of important issues and concerns by the public and other agencies, and description of the Proposed Action are discussed in Chapters 1 and 2 of this Final SEIS. Public and agency input was extremely important in formulating the scope and content of the Final SEIS. However, scoping *prior to* the preparation of the Draft SEIS should not be confused with the comments received *on* the Draft SEIS.

N.1.1 Public and Agency Meetings

The CEQ regulations [40 CFR 1503.1] invite the public to review and comment on the Draft SEIS. The BLM NEPA Handbook specifies that at least 45 days be allowed for this comment period. A Notice of Availability (NOA) was published in the *Federal Register* (Vol. 75, No. 14) by the BLM on January 22, 2010, announcing the availability of the Draft SEIS for public review and comment. The initial close of the comment period was March 22, 2010.

Following the release of the Draft SEIS, the BLM Las Vegas Field Office hosted three public meetings throughout the Las Vegas Valley on February 22, 23, and 24, 2010, to provide the public with an

opportunity to comment on the potential environmental impacts described for the alternatives in the Draft SEIS. Meetings included a brief presentation describing the purpose of and need for determining a final CTA boundary, the alternatives, and the next steps. A court reporter was in attendance to record comments received from members of the public.

At the request of the public, the BLM extended the public comment period. A second NOA was published in the *Federal Register* (Vol. 75, No. 54) by the BLM on March 22, 2010, announcing that the public would have an additional 60 days to provide comments to the BLM on the Draft SEIS. No additional public hearings were scheduled. The comment period closed on May 24, 2010.

Written comments were accepted at the public hearings, via email, and via mail. Comments were also accepted through the BLM website (http://www.blm.gov/nv/st/en/fo/lvfo.html).

The official close of the comment period was May 24, 2010. All comments received and the associated responses are provided in Appendix N of this Final SEIS, which can be found on the CD inserted on the back cover, or as a hard copy from the BLM, as requested.

N.1.2 Comment Procedure

Those receiving a copy of the Draft SEIS and/or attending the public meeting were afforded several methods for submitting comments and were given instructions on how to provide comments and where they should be sent. They were advised that comments should be as specific as possible in terms of adequacy of the Draft SEIS and/or merits of the alternatives discussed. Comment forms were provided at the February 22, 23, and 24, 2010, public meetings.

Comment Processing

Approximately 1,930 letters, facsimiles, e-mails, and testimony (henceforth collectively referred to as comment letters) were received during the comment period for the Draft SEIS.

Comment letters were copied and sent to a third-party consultant, where they were placed in the project planning record.

More than 1,750 of these responses were email form letters, that is, comments containing the exact same wording (or very similar), which had been copied and pasted verbatim into an email and then sent to the BLM by different respondents. All form letters received were from individual respondents. An additional 40 letters were variations of the form letter that had been altered sufficiently (text deleted) to be treated as unique letters and coded separately. Approximately 60 additional letters were form letter “pluses,” that is, they contained the text of the original form letter but had additional comments that needed to be coded. All form letter “plus” and form “minus” communications were sent by individual respondents. The rest of the letters received were unique letters, emails, and comment forms or were comments transcribed by a court reporter during the formal hearing.

All comment letters that were not identified as form letters were numbered sequentially (beginning with 1) and labeled with a code that indicated the type of entity from which it was received (i.e., individual, government agency, tribe, business, or nongovernmental organization). This combination of number and entity code resulted in a unique alphanumeric identifier (letter ID) for each individual letter or form submitted, which was then cross-referenced with the respondent contact information. The table in Section N.3, below, contains the letter ID and respondent name and entity name (if applicable) for all non–form letter comments received.

Because of the volume received, form letters were not given unique alphanumeric identifiers. Instead, the names of all respondents who sent in form letters were automatically extracted from emails and entered into a form letter contact information spreadsheet, which is contained on the CD.

Comment Analysis and Summary

Each unique letter (and one form letter "master" for each form letter type) was reviewed for the specific comment(s) it contained. "Form plus" letters were identified as such and reviewed only for additional comments. Comments from each letter were identified and organized into resource or discipline categories. Those comments that were identical or very similar were grouped together under a summary of the issue(s) or concern(s) raised. This form of analysis allows for specific comments to be captured and grouped by general topic or resource issue.

Section N.4 includes a summary of comments organized into theme categories, along with the associated general response to the comment. The Response to Comments CD contains a spreadsheet of all comments extracted from letters and their associated responses. Comments on the spreadsheet are identified by letter ID for cross-referencing with the contact information table.

The full text of each comment letter received from individuals or groups are in the BLM's Upper Las Vegas Wash (ULVW) Conservation Transfer Area (CTA) project files at the BLM Office in Las Vegas, Nevada, and may be viewed upon request.

Consistent with CEQ regulations implementing NEPA [40 CFR 1503.4(b)], this document focuses on substantive comments on the Draft SEIS. Substantive comments include those that challenge the information in the Draft SEIS as being accurate or inaccurate, or that offer specific information that may have a bearing on the decision. Comments that merely express an opinion for or against the Proposed Action were not identified as a comment requiring a response. In cases where the comment was substantive but appeared to indicate that information in the Draft SEIS was either misunderstood or unclear, a response was prepared that clarified the information. Resource specialists from the third-party consultant prepared draft responses to each substantive comment, which were then reviewed and approved by BLM personnel.

N.2 READER'S GUIDE

N.2.1. Instructions for Referencing Comments

Readers wishing to read a general summary of comments and responses should refer to Section N.4, which consists of a summary of comments organized into theme categories, sample statement(s) from an actual comment letter, and the associated response to the comment.

Readers wishing to find specific comments and responses will need to refer to the following tables:

- Table N.1, CTA SEIS Respondent List_Unique And Form Plus Letters (located in Section N.3 of this document, as well as on the CD).
- Table N.2, CTA SEIS Respondent List_Form Letters (available on CD).
- Table N.3, CTA Comments and Responses (available on CD). Each entry in this table is a distinct comment extracted from a letter and contains the following: the letter ID (column A); the comment number within the letter (column B); the resource to which the comment was coded (column C); the theme to which the comment was coded within the primary resource code

(column D); the comment disposition (column E); the actual comment (column F); and its response (column G).

Reader should refer to the Table N.1 to find a respondent name/entity and then use the corresponding letter ID number to identify all comments and responses associated with that letter in Table N.3.

Form letter respondents are listed in Table N.2. Although some respondents sent more than one email of the form letter, duplicate entries have been removed from this list. Because the content of each letter was the same, these letters were not given unique letter ID codes. One form letter master (FLM) was coded and is included in Table N.3 with the notation "FLM" in Column B.

N.3 INDEX OF AGENCIES, ORGANIZATIONS, AND INDIVIDUALS WHO COMMENTED ON THE DRAFT SEIS

The following table includes provides an index of agencies, organizations, and individuals who sent unique comment letters on the Draft SEIS. Respondents who sent in form letters are listed in a form letter spreadsheet, which is contained on the CD.

Table N.1. CTA SEIS Respondent List, Unique and Form Plus Letters

Letter ID		Organization	Last Name	First Name	Last Name	First Name
O-	163	Center for Biological Diversity	Mrowka	Rob		
G-	164	Department of Administration, State Historic Preservation Office	Palmer	Rebecca		
G-	165	Department of Air Force	Macneill	Deborah		
G-	167	Nevada Division of Transportation	Schneider	Paul		
G-	168	State of Nevada Department Of Wildlife	Hardenbrook	Bradford		
O-	169	Desert Conservation Program	Henson	Marci		
G-	170	U.S. Environmental Protection Agency	Goforth	Kathleen	Fujii	Laura
G-	171	U.S. Fish and Wildlife Service	Williams	Robert		
I-	172	Individual	Shields	Gale		
I-	173	Individual	Gamboa	Terri		
I-	174	Individual	Gillespie	Marilyn		
I-	175	Individual	Gleason	Julie		
I-	176	Individual	Giunchigliani	Chris		
T-	177	Hopi Tribe	Kuwanwisiwma	Leigh		
T-	179	Las Vegas Paiute Tribe	(non given)			
O-	180	Desert Conservation Program	Henson	Marci		
I-	181	Individual	Mcgee	Joe		
I-	182	Individual	Moll	Jessie		
I-	185	Individual	Nancarrow	Barb		
O-	187	National Parks Conservation	Davis	Lynn		
I-	188	Individual	Rothfoss	Ed		
I-	189	Individual	Musser	Chad		

Table N.1. CTA SEIS Respondent List, Unique and Form Plus Letters (Continued)

Letter ID		Organization	Last Name	First Name	Last Name	First Name
I-	190	Individual	Sharpio	Madeline		
I-	191	Individual	Haskell	Michael		
I-	192	Individual	McDuffie	Marcia		
I-	193	Individual	Furtek	Robert		
I-	194	Individual	Gentis	Nancy		
O-	195	Southern Nevada Regional Trails Partnership	Dodrill	Ed		
G-	196	National Park Service	Fremd	Theodore		
G-	197	Department of the Air Force	MacNeill	Deborah		
G-	199	Southern Nevada Water Authority	Marshall	Zane		
G-	200	Board of County Commissioners	Hollis	Gary		
B-	201	Southwest Desert Equities, LLC	(none given)			
G-	204	Cities of Las Vegas and North Las Vegas	Fretwell	Elizabeth	Ustick	Maryann
G-	205	Regional Flood Control District	Sutko	Timothy		
B-	206	Valley Electric Association, Inc.	Husted	Thomas		
I-	207	Individual	Zavaitaro	Peter		
I-	208	Individual	Siriann	Anthy		
I-	210	Individual	Shields	Chuck		
I-	211	Individual	Santos	Mary		
I-	212	Individual	Rothfuss	Ed		
O-	213	Protectors of Tule Springs	DeStefano	Jill		
I-	214	Individual	Hiott	(none given)		
I-	215	Individual	Mortenson	(none given)		
I-	216	Individual	DeStefano	(none given)		
I-	217	Individual	Gentis	(none given)		
I-	218	Individual	Finn	(none given)		
O-	219	Protectors of Tule Springs	Croteau	Sandi		
I-	220	Individual	Mortenson	Helen		
I-	221	Individual	Fightmaster	Judy		
I-	222	Chong Lee & Associate	Lee	Chong		
O-	224	Desert Wetlands Conservancy	Wolf	Art		
T-	225	Las Vegas Paiute Tribe	McHugh	Stephen		
O-	226	Red Rock Audubon Society	Hiatt	Hermi	Hiatt	John
I-	227	Individual	Ward	Rodney		
I-	228	Individual	McGee	Joe	Bridge	Mary
O-	229	Center for Biological Diversity	Mrowka	Rob		
I-	230	Individual	Myers	Stephanie		
G-	231	Nye County	Holis	Gary	Choate	Zoie
I-	232	Individual	Krist	Wade		
I-	233	Individual	Dodril	Edward		

Table N.1. CTA SEIS Respondent List, Unique and Form Plus Letters (Continued)

Letter ID	Organization	Last Name	First Name	Last Name	First Name
I- 234	Individual	Shapiro	Madeline	Shapiro	Myles
I- 235	Individual	Gentis	Nancy		
I- 236	Individual	Hathaway	Mel		
I- 237	Individual	Cooper	Timothy	Cooper	Barbara
I- 238	Individual	Breckenridge	John		
I- 239	Individual	Wynne	Sherryl		
I- 240	Individual	McLaughlin	Catherine		
I- 241	Individual	Hull-Richter	Mark		
I- 242	Individual	Liveri	Anthony		
I- 243	Individual	Collins	Wendy		
I- 244	Individual	Hunter	Marianne		
I- 245	Individual	Tawil	Felicia		
I- 246	Individual	Charney	Danielle		
I- 247	Individual	Marshall	Craig		
I- 248	Individual	Cook	Shaela		
I- 249	Individual	Shirley	Aida		
I- 250	Individual	Crampton	Lisa		
I- 251	Individual	Lane	Susan		
I- 252	Individual	McGuire	Mark		
I- 253	Individual	Penner	Marsha		
I- 254	Individual	Robison	Hillary		
I- 255	Individual	Miller	Caleb		
I- 256	Individual	Knight	Diane		
I- 257	Individual	Vergun	Alexandra		
I- 258	Individual	McLaughlin	Janet		
I- 259	Individual	Brauer	Ann		
I- 260	Individual	Walker	David		
I- 261	Individual	Porter	Dina		
I- 262	Individual	Ash	Kathy		
I- 263	Individual	Van Beveren	Chris		
I- 264	Individual	Cox	Joseph		
I- 265	Individual	Kran	Bruce		
I- 266	Individual	Odani	Monica		
I- 267	Individual	Graham	Noel		
I- 268	Individual	Suarez	Juan		
I- 269	Individual	Blau	Jnan		
I- 270	Individual	Asgarian	Mahgum		
I- 271	Individual	Markus	Mary		
I- 272	Individual	Karp	Michael		

Table N.1. CTA SEIS Respondent List, Unique and Form Plus Letters (Continued)

Letter ID	Organization	Last Name	First Name	Last Name	First Name
I- 273	Individual	Schwab	Ernest		
I- 274	Individual	Buchanan	Tim		
I- 275	Individual	Stires	Vern		
I- 276	Individual	Goetz	Linda		
I- 277	Individual	Gorny	Carolyn		
I- 278	Individual	Graham-Gardner	Rosemary		
I- 279	Individual	Cousins	Cathy		
I- 280	Individual	Baum	Phil		
I- 281	Individual	Churchward	Jen		
I- 282	Individual	Vernand	Nancy		
I- 283	Individual	Santos	Mary		
I- 284	Individual	Soraghan	Conor		
I- 285	Individual	Yurek	Ellen		
I- 286	Individual	Shumate	Charlene		
I- 287	Individual	Barber	Janet		
I- 288	Individual	Sargeant	Heather		
I- 289	Individual	Nervig	Deborah		
I- 290	Individual	Berk	Jean		
I- 291	Individual	Moore	Linda		
I- 292	Individual	Varellas	Barb		
I- 293	Individual	Marmor	Loretta		
I- 294	Individual	Campbell	Therese		
I- 295	Individual	Fischer	Stephen		
I- 296	Individual	Cockrell	Scott		
I- 297	Individual	Berger	Brad		
I- 298	Individual	Anderson	Ileene		
I- 299	Individual	Colby	Mark		
I- 300	Individual	Cherin	Marise		
I- 301	Individual	Eaton	Chris		
I- 302	Individual	Olsen	Jennifer		

N.4 PUBLIC COMMENTS AND RESPONSES

N.4.1 Summary of Respondent Letter Attribute Information

Total Number of Responses

- 1,936 responses:
  - 23 unique letters

- 18 unique emails
- 11 public comment forms
- 1,773 form letters
- 39 letters that contained portions of the form letter, but lacking enough that they were captured separately
- 61 form letters "pluses" (containing additional comments that were coded)
- 1 webform submittal containing no text
- 10 speakers at the public hearing

Respondent Types

- 1,914 responses from individuals; 1,809 of these were form letter and form letter "minus" comments
- 13 responses from governmental entities (count does not include duplicate letters):
  - Federal Government: U.S. Fish and Wildlife Service; U.S. Environmental Protection Agency; National Park Service; Department of the Air Force
  - State Government: Nevada Division of Transportation; Nevada Department of Wildlife Nevada; Department of Administration, Nevada State Historic Preservation Office (SHPO)
  - Regional and Local Government: Southern Nevada Water Authority; Board of County Commissioners; Cities of Las Vegas and North Las Vegas; Regional Flood Control District; Nye County
- 2 tribes: Las Vegas Paiute Tribe and Hopi Tribe
- 2 businesses: Southwest Desert Equities, LLC, and Valley Electric Association, Inc.
- 10 nongovernmental organizations: Center for Biological Diversity; Desert Conservation Program (2 separate letters); National Parks Conservation Association; Southern Nevada Regional Trails Partnership; Protectors of Tule Springs (2 entries from the public hearing transcript); Desert Wetlands Conservancy and Red Rock Audubon Society.

N.4.2 Summary of Formal Comments by Resource Code

More than 750 unique comments have been extracted from the 1,936 comment letters received during the formal comment period. The following section contains a summary of the comments received by resource, followed by a general response. Total comment count for each resource is included. Resource subcodes applied to comments contained in the form letter are also noted.

Although comments were received for all resources in the SEIS, most substantive comments fell into 3 categories:

1. Alternatives
2. Process
3. Water Resources

Process and alternatives development comments overlap to some degree in that the two issues most frequently raised as requiring resolution in the Final SEIS—consistency with the *Las Vegas Valley Disposal Boundary Final Environmental Impact Statement* and Record of Decision (LVVDB

FEIS/ROD); and consideration of, and consistency with, state, regional, and local regulations and planning efforts—were seen not only as issues requiring the formulation of new alternatives, but also as process inadequacies.

Water issues primarily centered on the adequacy and accuracy of the hydrologic model, particularly with regard to input data and calculation methodologies.

Form letter comments were primarily comments expressing general support for Alternative A, and as such, fell mainly into the "Miscellaneous" category. Although these comments were largely not substantive and do not require a response, a summary of each rationale offered in support of each alternative is included in the Miscellaneous section of this document.

In addition to the response letters received on the Draft SEIS, the Protectors of Tule Springs provided approximately 9,000 signatures to the BLM in support of designating the 13,000 + acres of the CTA study area as part of a National Conservation Area managed by the BLM.

Alternatives (ALT) 60 comments, as well as form letter and form letter "plus" comments

Alternatives Development Process

Respondents asked for clarification about how stakeholder input was used in defining alternatives and how inconsistencies between the alternatives and the regulatory guidance were evaluated and/or reconciled.

Response

Page 4 of the Draft SEIS states,

> Additionally, the BLM, with technical assistance from Utah State University (USU), has been conducting numerous studies that, among other things, are designed to specifically identify the locations within the CTA study area that possess the most sensitive resources. Based on those preliminary study results, USU personnel prepared a report titled Upper Las Vegas Wash Conservation Transfer Area: A System to Develop Alternative Scenarios.

The BLM reviewed the LVVDB FEIS/ROD, the results of the USU Report, and all input and recommendations from cooperators and the various stakeholders in determining a final CTA study area boundary. The final CTA study area boundary took into consideration the various objectives of stakeholders, which ranged from maximum development opportunities to maximum conservation.

Based on the Southern Nevada Public Lands Management Act, as amended (SNPLMA), the LVVDB FEIS, USU Report, public input, and local BLM staff resource expertise, preliminary alternatives were developed for presentation at public scoping meetings held in Las Vegas from August 14 through 16, 2007. Comments and recommendations received during those meetings, the public scoping comment period (July 6, 2007–September 4, 2007) for the CTA SEIS, and at a design workshop hosted by the City of Las Vegas in December 2007 were considered in formulating the alternatives presented in the Draft SEIS. In addition, the resource knowledge of local BLM staff aided in further refining the alternatives. Alternative boundary recommendations for the CTA range from approximately 3,300 to almost 13,000 acres.

Section 1.5 of the SEIS describes the relevant statutes, regulations, and guidelines that may apply to establishment of the final boundary of the CTA. The alternatives analyzed are consistent with these guidelines, and the guidelines would also be applied in the development of the Conservation Agreement.

Alternatives Consistency with the LVVDB FEIS/ROD

Respondents suggested that the range of alternatives developed for the SEIS is both inconsistent with what was examined in the LVVDB FEIS/ROD and the intent of the SEIS (see additional comments regarding this issue under Process). Respondents indicated that the range of alternatives should have included a smaller acreage option consistent with that examined in the LVVDB FEIS/ROD, which was 5,000 acres. Respondents also indicated that the LVVDB FEIS/ROD specified that alternatives that were to be developed would address different management scenarios for transfer of the CTA. Additionally, respondents suggested that the development of alternatives that did not include allowable uses was contrary to the language contained in the LVVDB FEIS/ROD, the authority for development of the SEIS.

Response

Alternatives analyzed in the Final SEIS range from 1,448 to 12,952 acres, as described in Chapter 2, and include the 5,000-acre boundary as identified in the LVVDB FEIS/ROD. Additionally, as described in Section 1.3.3 of the Draft SEIS, the only decision being made by the BLM at this time is on the final CTA boundary; no decision is being made on future land uses. The LVVDB FEIS/ROD does not call for land use allocations to be made in this Final SEIS.

Although the BLM is not making a decision on allowable uses through this SEIS, information provided by stakeholders is still necessary to support future BLM decisions on specific management of the area. The input provided will be used to develop a Conservation Agreement and associated planning documents, in particular, revisions to the *Proposed Las Vegas Resource Management Plan and Final Environmental Impact Statement* (Las Vegas RMP) (BLM 1998a) that were initiated in October 2009. In the Las Vegas RMP revision, the BLM will examine resource allocation for rights-of-way (ROWs), corridors, trails, other infrastructure, and protection.

Boundary Reconfigurations or New Alternatives

It was requested that the boundary of Alternative D be modified to create a new alternative, Alternative D2. Respondents suggested this change would require minimal changes and although similar to Alternative B, the BLM's Preferred Alternative, would offer better protection to paleontological resources.

Respondents also provided general comments urging that a national monument alternative be considered.

Response

The BLM appreciates the requests and recommendations for a revised Preferred Alternative boundary. After further review of the analysis and the public comments received from the Cities of Las Vegas and North Las Vegas and the Las Vegas Paiute Tribe, the BLM has changed the Preferred Alternative boundary (Alternative B) to adjust the area north of the Paiute Reservation to allow for additional acreage to be available for disposal and private development while continuing to provide for the protection of sensitive resources. Although the Preferred Alternative boundary is not the requested Alternative D2, it does allow for the disposal and subsequent private development of an additional 512 acres north of the Paiute Reservation and south of the ULVW.

As stated in Section 2.5.2 of the Final SEIS, while the BLM can have management responsibility for national monuments, the BLM has no authority to make that designation. National monuments are established through Presidential Proclamation under authority of the Antiquities Act of 1906 or Congress can also designate national monuments through monument-specific legislation. This alternative was

eliminated from further consideration in the Final SEIS because these designations require Presidential and/or Congressional action.

Addition of Lands to Existing CTA Alternatives

It was requested that one particular parcel, 125-03-501-001, be added to the CTA boundary, as it would be nearly surrounded by the CTA, and because it contains sensitive resources and would require ROWs through the CTA for infrastructure. Requesters noted that earlier alternatives reports included also made this recommendation as a way to provide connectivity within the ULVW for ecological and recreational functions.

Respondents indicated that Eglington Preserve and the Tule Springs state land parcel were not included in all alternatives, in spite of the Eglington Preserve Conservation Agreement, which indicated the preserve would be managed as part of the CTA.

Respondents also suggested that the alternative parcels were not configured with preservation of the fossil resources in mind and do not include very important sites to the north (also controlled by the BLM). Form letter comments suggested that no development be allowed north of the ULVW.

Response

Although private parcel 125-03-501-001 and the Tule Springs state lands parcel contain sensitive resources, the BLM does not have the authority to designate state or private lands within the CTA. Should the private land be acquired by the BLM in the future, the BLM would consider its inclusion in the final CTA boundary at that time.

Because the Eglington Preserve was not included in the preliminary CTA boundary identified in the LVVDB FEIS/ROD, it was not included in every alternative analyzed in the Final SEIS. Although the Eglington Preserve is not included in every alternative, it is within the BLM Preferred Alternative and would be managed under the Conservation Agreement.

Because the Final SEIS supplements the LVVDB FEIS, the CTA boundary alternatives are limited to lands within the Las Vegas Valley disposal boundary and did not consider lands to the north for inclusion.

Removal of Lands from Existing CTA Alternatives

Reference to McCool Park should state that BLM has approved the plan of development for the park, which includes a model airplane field, nature park, xeriscape demonstration project, sod farm, and tree farm site. In addition a pump station is located at the site. Also note that existing improvements include the model airplane flying area and the University of Nevada experimental garden (refer to p. 73). As an approved R&PP Act lease, the consideration of that portion of McCool Park not within the Tule Springs Registered Historic Site, and the Floyd Lamb Park R&PP Act lease lands should be excluded from consideration within the CTA.

Response

The portion of McCool Park outside the Tule Springs National Register Site is not included within the BLM Preferred Alternative boundary. All authorized R&PP Act leases, including those within the Preferred Alternative, including the Floyd Lamb Park R&PP Act lease, would be managed under a BLM-approved plan of development to be consistent with requirements of the Conservation Agreement.

Inclusion of Rights-of-Way to Existing CTA Alternatives

Respondents requested clarifications or changes regarding the inclusions of ROWs in the alternatives. Several respondents with existing ROWs indicated that a continuation of current uses, as well as the ability to continue with planned improvements, would be critical to their organizations. Respondents also indicated that the BLM is required to issue ROWs to local governments for facilities related to water, sewer, and flood control.

Respondents also questioned the apparent removal of Sheep Mountain Parkway from the Preferred Alternative, noting that a Finding of No Significant Impact (FONSI) had been issued for Sheep Mountain Parkway in which BLM granted a 500-foot-wide ROW in 2005. Respondents also noted that the BLM had indicated in 2008 meetings with cooperating agencies that a 100-foot-wide ROW for the Sheep Mountain Parkway would be included in the Preferred Alternative.

It was also proposed that the CTA should include the establishment of a utility transmission corridor to meet existing and future needs.

Response

Changes to existing ROWs or current uses are not being designated in this Final SEIS. Additionally, the BLM is not making decisions on future allowable uses, utility or transportation corridors, or ROWs within the final CTA boundary through this SEIS. The only decision being made is on the final CTA boundary. Future allowable uses on BLM-managed lands will be determined through the land use planning process. The consideration of land use allocations and allowable uses on lands in the final CTA will be addressed through the current BLM Southern Nevada District's resource management planning process. Specific projects and actions associated with local plans could be implemented in parts of the CTA consistent with the best management practices (BMPs) and mitigation measures as required by the Conservation Agreement.

Cultural Resources (CUL) 23 comments

General Corrections

Respondents noted that the SEIS should be corrected to note that SHPO has already provided concurrence with the Historic Properties Treatment Plan for sites 26Ck6507 and 26Ck6910. It was also noted that references to the Tule Springs National Register of Historic Places (NRHP) property are not reflected in most of the maps in the SEIS. Readers also requested a clarification of the statement that "no documented NRHP-eligible or NRHP-listed cultural resources will be directly affected by any of the alternatives," noting that Table 4.5-1 suggests a "small to greater possibility of direct impacts from recreation activities for each alternative." A clarification was also requested regarding second resource (under site 26Ck247) in Table 4.5-1.

Response

Because of the timing of the preparation of the Draft SEIS, tasks were completed prior to publication of the draft. The SHPO did provide concurrence prior to completion of the mitigation. Section 3.5.3 of the Final SEIS has been revised to indicate that the SHPO has concurred with the BLM recommendations. Additionally, Table 4.5-1 in the Final SEIS has been revised: there would be no direct impact from any of the alternatives, and there would be variable indirect impacts resulting from the increased development and human presence surrounding the Tule Springs NRHP site. Each alternative figure in Chapter 2 has been revised to indicate the Tule Springs NRHP property.

Tribal Coordination and Consultation

Paiute tribal comments expressed support for the protection of the areas and expressed a desire for continued consultation, noting the CTA's proximity to the Snow Mountain Reservation. The Hopi Tribe requested a copy of the treatment plan for Site 26Ck6910 for review.

An additional comment regarding tribal consultation requested clarification regarding the process by which alternatives were deemed acceptable/not acceptable and the area identified as a Traditional Cultural Property (TCP).

Response

The impacts to tribes from each of the CTA alternatives were determined through BLM's direct consultation with tribal representatives. The BLM also understands that the Las Vegas Paiute Tribe has recently been working closely with the City of Las Vegas on mutually beneficial future planning as it relates to the alternative boundaries. The final BLM Preferred Alternative boundary has been revised based on comments received from both the Las Vegas Paiute Tribe and the Cities of Las Vegas and North Las Vegas, and now lands north of the reservation and south of the ULVW would be available to the City of Las Vegas for disposal and private development.

Traditional Cultural Properties

Many of the comments focused on the identification of the landscape as an NRHP-eligible TCP and the subsequent determination of significant impacts to this TCP for most of the alternatives. Readers noted that this TCP was not included in the table of NHRP-eligible sites, nor was it listed in the LVVDB FEIS, the Shooting Park Environmental Assessment (EA) or the West-wide Energy Corridor Programmatic Environmental Impact Statement. Readers further noted that the landscape has already been modified by projects on tribal lands such as golf courses and requested clarification regarding the "border" of the TCP and why it apparently does not include tribal lands. Respondents also questioned the determination of no impacts to TCPs for Alternative B, noting that it, too, allows development on the landscape.

Respondents also indicated that some of the sources used in this analysis refer to other areas of the Spring Mountains and that the mountains' context and relevance should be more clearly discussed.

Response

The Las Vegas Paiute Tribe has recognized the area as important during the BLM tribal consultation specific to the CTA SEIS process. A more detailed meaning of a TCP has been added to Section 3.5.4 of the Final SEIS. Section 3.5.4 of the Final SEIS states,

> Tribal representatives have shared their views with BLM and SWCA that the entire LVW in and of itself represents an important cultural landscape and potential TCP for the Las Vegas Paiute Tribe and other tribal communities in the area, such as the Chemehuevi and Moapa Paiute. A TCP is considered a property or site that is eligible for inclusion in the NRHP because of its association with cultural practices or beliefs of a living community, that are rooted in that community's history, and that are important to preserving the cultural identity of that community. Tribal communities have stressed that the aboriginal homeland includes both the washes and the surrounding area: the whole of the landscape has cultural and religious importance to the Paiute people.

The impacts to TCPs from each of the CTA alternatives were determined through BLM's direct consultation with the Tribes.

Land Use (LU) 32 comments

Affected Environment

Comments pertaining to the Land Use section of the SEIS requested map depictions of frequently referenced sites and infrastructure. Respondents also requested clarifications or corrections regarding the location of existing physical features and facilities; characterization of applicable land use categories; and identification of authorized and pending leases, ROWs, and land ownership.

Response

Figure 3.8-1 and Table 3.8-1 in Section 3.8.3 of the SEIS provide a comprehensive map and table of known ROWs and infrastructure within the CTA study area. With the exception of the state-owned Tule Springs NRHP site, the lands within the CTA study area are currently managed by the BLM Las Vegas Field Office.

Environmental Consequences

Respondents indicated that the comparison of land use impacts as shown in Table 4.8-1 should have presented not just a comparison of boundary acreages, but also information on the impacts to the nine land use groups defined in Section 3.8.2, how the existing ROWs and R&PP Act leases listed in Table 3.8-1 are addressed in the analysis, and disclosure of any impacts to authorized land uses. Respondents also suggested that impacts to land use needed to be presented in context.

Respondents also questioned why the Draft SEIS did not apply the same impact thresholds as in the LVVBD FEIS and also questioned why the community land use plans described in Section 3.8.2 are not considered in the identification of impact thresholds.

Response

Lands in the CTA study area are currently managed by the BLM Las Vegas Field Office and not under the identified community land use plans. There would be no change to existing land uses on private lands outside the CTA study area under any of the alternatives. There would be no change to existing ROWs within the CTA boundary under any of the alternatives. The BLM will be consistent to the extent possible with local plans, and any future land uses described in these local plans would be considered on a case-by-case basis in the final CTA boundary. Any future land uses would follow the BMPs and mitigation measures that will be required by the Conservation Agreement.

Miscellaneous (MS) 175 comments, as well as form letter and form letter “plus” comments

Most comments in this category expressed general concern about a specific resource, or expressed general support for or opposition to alternatives. Requests to be added to the mailing or copies of the NEPA document were also included in this category.

Comments in support of Alternative A cited the following reasons:

1. It provides the greatest protection of species such as Las Vegas bearpoppy, Merriam’s bearpoppy, and the desert tortoise.
2. It provides the greatest protection of known exposed fossil sites and the geological strata.
3. It best preserves the option for the establishment of a national monument because its boundaries are most consistent with those of the proposed national monument.

4. It is one of the last unique places in the Las Vegas Valley that has not already been developed.
5. It supports a lower level of development in a time where Las Vegas is already suffering socioeconomic impacts from overdevelopment.
6. It preserves the hydrologic and erosive processes in the CTA in a manner similar to the present conditions.

Comments in support of Alternative B cited the following reasons:

1. It keeps the natural functioning and hydrology of the ULVW intact, preserves sensitive resource values, and provides opportunities for recreation, education, and research.
2. It is consistent with the authorizing legislation, the SNPLMA, and its mandate to promote the preservation of natural, scientific, aesthetic, historical, cultural, watershed, wildlife, and other values; enhance recreational opportunities and public access; and provide the opportunity to achieve better management of public land through consolidation of federal ownership.

Comment in support of Alternative D2 cited the following reasons:

1. It is the environmentally preferable alternative because it goes beyond the protection of plant and paleontological resources provided by Alternative B.
2. It limits the adverse environmental effects of the displaced development resulting from the project.
3. It provides for transmission of green energy.
4. It ensures public safety.

Mitigation, General (MIT) 3 comments

This category was used to classify general comments pertaining to mitigation. Resource-specific mitigation measures are discussed under the applicable resource sections.

Respondents questioned how mitigation or BMPs can be included in the Final SEIS if no decisions are being made on land uses. Respondents also indicated that mitigation measures required by permitting or local planning regulations should be considered in the analysis of impacts. Conversely, other respondents suggested that additional information on monitoring and enforcement measures should be included in the Final SEIS.

Response

Although no decisions on allowable land uses are being made, the recommendations on BMPs in Appendix A of the Final SEIS would be used to guide the development of the Conservation Agreement and future land use authorizations to provide for the long-term protection of sensitive resources within the CTA. Mitigations would be applied to lands within the final CTA boundary, as required by the BLM, on future ROW requests. The BLM cannot require mitigation on lands lying outside the CTA boundary once they are disposed of for future development. Although the private development outside the CTA boundary would be subject to regulations, ordinances, and other mitigations, impacts to the various resources would still occur from that development.

Noise 7 comments

Respondents asked for clarification regarding the impact threshold choices, as well as a quantitative definition of terms such as “long-term, moderate increase.” Respondents also questioned the inclusion of impacts from construction activities in the analysis, since the BLM is not considering allowable land uses in the CTA. They also questioned the conclusion that there could be adverse impacts to sensitive noise receptors, since it is not known where noise sensitive receptors are or could be located.

Readers noted that aircraft noise was not included in the analysis and also suggested that the noise assessment for the Clark County Shooting Park be included in the analysis.

Response

A brief description of aircraft noise and information from the Clark County Shooting Park noise assessment has been added to Section 3.11 of the Final SEIS. Additionally, Section 4.11.5 of the Final SEIS has been revised to clarify that the potential impacts to sensitive noise receptors from future actions would be determined and mitigated as part of the site-specific planning process for any future approved developments.

Paleontology (PAL) 39 comments

Impact Analysis

Respondents questioned the determination of significant adverse impacts for only Alternatives D and E and the No-Action Alternative, noting that objective data indicate little difference between Alternatives D and B. Respondents further noted that a slight reconfiguration of Alternative D would eliminate the difference entirely.

Respondents also suggested that more data are needed to more accurately analyze impacts to the Las Vegas Formation and its fossils, citing a USU Report that they said should have been included as a source for the analysis. Respondents also indicated that additional information regarding paleontological resources should have been included in the Draft SEIS, including general site location, as well as potential access control, public education, and recovery methods.

Response

No additional data were determined necessary for the analysis of impacts to the Las Vegas Formation and its fossils. Section 3.6, Paleontological Resources, is an adequate description of the existing conditions within the overall CTA study area. Part of the purpose of and need for the BLM’s CTA action is to protect sensitive paleontological resources. Section 3.6 identifies the BLM’s objectives for the management and conservation of paleontological resources within the CTA, including configuring a boundary that includes the major fossil localities. Figure 3.6-1 already provides an overview of the Las Vegas Formation, which includes the key paleontological sites in the CTA study area, as well as known surface localities from 2004.

Table 4.14-2 of the Final SEIS notes that the cumulative impacts of past, present, and reasonably foreseeable future actions, when considered with Alternatives D and E and the No-Action Alternative, would result in potentially significant impacts to paleontological resources. This conclusion has not changed. The Alternative D boundary was taken from the LVVDB FEIS/ROD preliminary CTA boundary. The remaining alternatives were developed to provide a range of conditions for analysis.

Mitigations that would apply to each alternative and that include public education and recovery methods are currently described in Section 4.6.9.

The BLM has revised the Preferred Alternative boundary in the Final SEIS, as described earlier, based on public comments and the ability to protect all sensitive resources, including the Las Vegas Formation and paleontological resources.

Mitigation and Recovery

Respondents indicated that the Draft SEIS should indicate that mitigation is best done through recovery, noting that fossils exposed to surface conditions will deteriorate rapidly and lose all scientific value. It was also suggested that the mitigation that would be required with future development may even reduce flood flows, which would provide greater protection of the paleontological resources by decreasing the erosion potential within the ULVW.

Response

Specific sites for in situ preservation have not been determined at this time. A treatment plan was prepared as part of the LVVDB FEIS/ROD that addresses methods and strategies for recovery of fossil resources. Additionally, Section 4.6.9 of the Final SEIS describes the Paleontological Mitigation Definitions and Procedures, including collection of surface fossils, monitoring for surface disturbance, on-site preservation, and ongoing survey and monitoring.

Process (PRO) 122 comments

Respondents suggested that several aspects of the NEPA process were not achieved.

Agency Consultation

The Cities of Las Vegas and North Las Vegas suggested that appropriate agency consultation should have included a wider group during development of the SEIS and delineation of the CTA boundary, noting that SNPLMA requires coordination with local governments and that as cooperating agencies, the Cities of Las Vegas and North Las Vegas should have been consulted for input during the alternatives development process. Southern Nevada Water Authority also requested that they be added to the Conservation Development Committee. Respondents also questioned why they had not been consulted regarding the removal of the proposed Sheep Mountain parkway ROW from the Preferred Alternative.

It was also suggested that the BLM give a presentation of their decisions regarding the CTA prior to issuance of an ROD. Respondents suggested that the BLM partner with local universities, museums, and conservation groups on preservation and interpretation initiatives.

Response

Although preparation of the Final SEIS is a BLM process, extensive stakeholder meetings, cooperator meetings, and public scoping was conducted prior to the development of alternatives for analysis. The Cities of Las Vegas and North Las Vegas were participants during the development of alternatives. The Cities submitted alternative boundary suggestions during the scoping process that were incorporated into the Draft SEIS for analysis. Additionally, the recommendations from an urban planning workshop hosted by the City of Las Vegas and described in the Proposed Upper Las Vegas Development Report (Rocky Mountain Institute [RMI] 2008) were applied by the BLM in creating the BLM's Preferred Alternative boundary. RMI suggested that "the City should consider developing the northeast portion of the study area at very low densities, or leaving the area undeveloped, instead concentrating development on the

south and northwestern portions of the site." The BLM's Preferred Alternative boundary was created in part based on Figure 10 in the RMI report, which showed an urban planning strategy for the lands north of Moccasin Boulevard and south of the wash that synthesized the recommendations from the report and the urban planning workshop. This land is outside the BLM's Preferred Alternative CTA boundary and would be available for disposal and private development. This information has been added to the description of the BLM's Preferred Alternative in the Final SEIS.

No decisions on allowable uses within the final CTA, such as the Sheep Mountain Parkway, are being made through this Final SEIS. Allowable uses on BLM-managed lands, including those that would occur within the final CTA boundary, will be determined through the current BLM Southern Nevada District's resource management planning process.

Compliance with Regulations, Policies and Procedures

Consistency with Southern Nevada Public Lands Management Act

Comments in this category pertained to consistency with SNPLMA. Readers noted several requirements of SNPLMA related to potential selection and management of disposal lands and suggested that the BLM may be acting in a manner inconsistent with the provisions of SNPLMA by doing the following: 1) potentially retaining management of any CTA lands; and 2) selecting lands for disposal without consideration of local government preferences and/or the management difficulties the BLM would face as a result of the location or proximity to private lands.

Response

The Final SEIS is consistent with SNPLMA. The purpose of SNPLMA is to provide for the disposal of certain federal lands in Clark County and does not require the disposal of federal lands. Section 2.2.2 of the Final SEIS states, "Based on the direction approved in the LVVDB FEIS ROD (BLM 2004b), BLM would dispose of lands within the CTA once all parties who are assuming management of the disposed lands sign a Conservation Agreement."

The Final SEIS does not suggest that the BLM will not sell or transfer lands within the disposal boundary based on recommendations made by local government. Lands outside the final CTA boundary would be available for disposal and future development and would not be subject to the terms of the Conservation Agreement. Lands within the final CTA boundary would be transferred once all parties who are assuming management of the disposed lands sign a Conservation Agreement that stipulates mitigation measures and other restrictions to provide for the long-term protection of sensitive resources within the CTA.

Consistency with Regional and Local Planning Efforts

Readers also asked for more explanation regarding how the Regional Transportation Commission (RTC) Regional Transportation Plan, Las Vegas Master Plan of Streets and Highways, Las Vegas Waste Collection System Master Plan Update, North Las Vegas Master Plan of Streets and Highways, North Las Vegas Park and Recreational Facilities Master Plan Update, and North Las Vegas Vision 2020 were considered during the development of alternative and analysis of impacts. Respondents requested that all inconsistencies of the Draft SEIS with local land use plans be detailed in the Final SEIS.

Response

Although no decisions on allowable uses are made in the Final SEIS, the BLM used information on the proposed infrastructure from the local land use plans to develop the assumptions for analysis as well as the reasonably foreseeable future actions for the cumulative impacts analysis section. The introduction to Chapter 4 of the Final SEIS describes the assumptions for analysis. Additionally, Section 4.14 and Table

4.14-1 of the Final SEIS describe the reasonably foreseeable future actions from these plans and the cumulative impacts of each alternative boundary with those actions.

Consistency with the BLM Resource Management Plan and NEPA Handbook

Readers were unclear about how consistency with the Las Vegas RMP, particularly objective VS-1 ("limit future impacts to the visual and aesthetic character of public lands in the planning area"), could be achieved if allowable uses are not considered in the SEIS. It was also noted that the SEIS references an out-of-date BLM NEPA handbook.

Response

The Final SEIS is in conformance with the Las Vegas RMP. The BLM has prepared the Final SEIS using the best available data and following the process outlined in the current BLM NEPA handbook. Decisions on allowable uses must be made through the BLM's land use planning process, not through this Final SEIS. Future proposed actions would be evaluated on a case-by-case basis for conformance with the Las Vegas RMP.

Consistency with the Federal Land Policy and Management Act

Readers also questioned consistency with the Federal Land Policy and Management Act (FLPMA), noting that although FLPMA provides for lands to be preserved in their natural condition "where appropriate," the SEIS did not provide an explanation of what analysis BLM did to determine whether it is appropriate for the CTA to preserve lands in their natural condition, rather than provide for human occupancy and use. Respondents also suggested that the Final SEIS should explain that nothing in FLMPA prohibits BLM from disposing of the CTA, provided that appropriate procedures are followed.

Response

Chapter 4 of the Final SEIS is an analysis of the impacts of the alternative CTA boundaries to a range of resources, including those identified in FLPMA for BLM management. Although nothing in FLPMA prohibits the BLM from disposing of lands, as described in Section 1.3.2 of the Final SEIS, the BLM is required to protect sensitive resources as described in the LVVDB FEIS/ROD, the Las Vegas RMP, and the SNPLMA.

Inconsistency with LVVDB FEIS/ROD

Respondents suggested that the scope and range of alternatives in the SEIS is inconsistent with the LVVDB FEIS/ROD (see additional comments under Alternatives). Respondents noted that the range of alternatives that was to be evaluated in the subsequent SEIS included the management of a 5,000-acre CTA by various entities and the associated land uses.

It should be noted that although comments pertaining to the boundary limits and management alternatives are broken out separately below, it was also suggested that these two issues are inextricably linked: the LVVDB FEIS/ROD recognized that the ultimate boundary of the CTA needed to be adaptable "*to meet the needs and concerns of interested parties participating in the development of the conservation agreement*" and as such, any CTA boundary designation is premature and cannot be fairly evaluated until a permanent manager is determined.

Boundary Limit Inconsistency

Respondents indicated a boundary increase to 13,622 acres was excessive and beyond the SEIS's authority as a supplemental compliance document.

Response

Although the ROD does identify an approximately 5,000-acre CTA, it further states, "It is intended that the boundary of the CTA be adaptable to the needs and concerns of interested parties." The CTA study area boundary was expanded following consideration of the LVVDB FEIS/ROD, the results of the USU Report, and all input and recommendations from the cooperators and various stakeholders. The final CTA study area boundary was expanded in order to consider the resource concerns identified in the USU Report as well as the objectives of cooperators and stakeholders, which ranged from maximum development opportunities to maximum conservation. Section 2.2 of the Final SEIS has been revised to better describe the development of alternatives.

Conservation Transfer Area Management Alternatives

Respondents indicated that because the range of alternatives does not include management of the CTA by various entities and the associated allowable land uses, as was provided for in the LVVDB FEIS/ROD, the SEIS has exceeded its authority as a supplemental compliance document. Respondents also suggested that the rationale provided for the dismissal of the consideration of alternative managing entities—that stakeholders expressed a desire for the BLM to retain management of the CTA—was not shared by all stakeholders and cooperating agencies.

Response

The BLM had to balance input from a variety of cooperators and different stakeholders in the preparation of the Final SEIS. The Final SEIS states that the BLM would only continue to manage lands within the final CTA boundary until such time as an outside entity meets the requirements of a BLM-approved conservation management strategy and the land is disposed of. Although no decision is being made on changing the management entity through this Final SEIS, Section 2.2.2, Components of Each Alternative, states that "BLM would dispose of lands within the CTA once all parties who are assuming management of the disposed lands sign a Conservation Agreement." This would apply to all of the alternatives, including the BLM Preferred Alternative.

Consideration of Allowable Uses

Readers were unclear about how consistency with the LVVDB FEIS Conservation Transfer Alternative (the alternative selected in the ROD) or local land planning processes could be achieved if allowable uses are not considered in the Final SEIS. However, other respondents also expressed concern that the establishment of any CTA boundary may preclude certain future land decisions in and of itself.

Response

During preparation of the Draft SEIS, it was determined that the allowable uses on BLM-managed lands can only be determined through the BLM land use planning process. The consideration of allowable uses on lands in the final CTA will be addressed through the current BLM Southern Nevada District's resource management planning process. Specific projects and actions associated with local plans would be considered on a case-by-case basis and may be implemented in parts of the CTA consistent with the requirements of the Conservation Agreement, which will be prepared for the final CTA boundary.

Consideration of All Connected Actions

Respondents suggested that establishing a CTA boundary and assessing appropriate land uses within that boundary are connected actions and that the Conservation Agreement should have been included in the Final SEIS analysis.

Response

Establishing appropriate land uses is not considered a connected action to the CTA boundary. In addition, the BLM can only make land use allocations through its land use planning process and not through this Final SEIS. Further, the BLM NEPA Handbook, in Section 6.5.2.1, states that "connected actions are limited to actions that are currently proposed and ready for a decision. Actions that are not yet proposed are not connected actions, but may need to be analyzed in cumulative effects analysis if they are reasonably foreseeable." The Final SEIS does address the reasonably foreseeable land uses in Section 4.14, Cumulative Impacts.

Lack of Site-Specific Analyses

Respondents suggested that the SEIS had not met its stated goal of conducting site-specific analyses for all resources.

Response

Chapter 4 of the SEIS provides an analysis of the impacts of alternative CTA boundaries to a range of resources identified through extensive internal scoping, stakeholder meetings, and public scoping.

Non-disclosure of Land Use Assumptions

Respondents suggested that a Final SEIS that clearly identifies prohibited and allowed uses should be developed.

Response

The BLM is only making a decision on the final CTA boundary at this time. Consideration of allowable uses on lands in the CTA will be addressed through the current BLM Southern Nevada District's resource management planning process. Specific projects and actions associated with local plans would be considered on a case-by-case basis and could be implemented in parts of the CTA consistent with the requirements of the Conservation Agreement, which will be prepared for the final CTA boundary.

Incomplete Analysis of Impacts of CTA Retention

Respondents suggested that the SEIS had overlooked key issues by not including a full consideration of the impacts of retaining the CTA.

Response

The BLM has prepared the SEIS using the best available data and following the BLM NEPA Handbook. The Final SEIS states that the BLM would only continue to manage lands within the final CTA boundary until such time as an outside entity meets the requirements of a BLM-approved conservation management strategy and the land is disposed of. This would apply to all of the alternatives, including the BLM Preferred Alternative. Because lands within the CTA boundary would not be available for private development, the effects of "leapfrog" development that may occur under Alternatives A and B are described in the socioeconomics cumulative impacts analysis (Section 4.14.13):

> Cumulative impacts could include additional demands on public facilities and services, as well as utilities and infrastructure. Additionally, the displaced development that would potentially occur under the alternatives would contribute to increased costs associated with transportation and community services in the LVV. Should new developments move further from existing urbanized

areas and employment opportunities in the LVV, there would be an increase in the economic costs associated with greater traffic congestion and commuting times (Entrix 2008).

Disclosure of Incomplete and Unavailable Information

Respondents indicated that instances of incomplete or unavailable data should have been more accurately disclosed in the SEIS document and cited the cultural and paleontological resource analyses as examples of where full disclosure was not achieved.

Response

The BLM has prepared the Final SEIS using the best available data and following the BLM NEPA Handbook. The assumptions that were made for analysis purposes are presented in Chapter 4 for both cultural and paleontological resources.

Consideration of National Monument Efforts

Respondents suggested the BLM should consider the impacts to the proposed establishment of a national monument, a related but separate citizen-based initiative that would include the CTA area and beyond, in its alternatives analysis and consider the ability to maintain a maximum boundary option for its establishment in the selection of its Preferred Alternative.

Response

The BLM is aware of the ongoing citizen-based initiative to designate the CTA study area and additional lands as a national monument. The BLM's final Preferred Alternative is based on the analysis in the Final SEIS and the comments received during the public comment period. Because this Final SEIS is a supplement to the LVVDB FEIS/ROD, the BLM cannot consider lands outside the Las Vegas Valley disposal boundary as part of the CTA boundary. Consideration of a potential boundary for the national monument by Congress is not limited by these factors.

Reasonable Opportunities for Public Involvement

It was requested that the comment period be extended. Readers also requested that better project materials be made available to the general public.

Response

The public comment period on the Draft SEIS was extended for an additional 60 days, for a total comment period of 120 days. Documents, maps, appendices, and geographic information system (GIS) data were readily available from the BLM throughout the comment period on the BLM's website and at the Las Vegas Field Office.

Purpose and Need (PN) 25 comments

Respondents indicated that a stated purpose of the SEIS, "preservation of natural hydrologic functioning" of the Las Vegas Wash, is inconsistent with the LVVDB FEIS/ROD, which recognized that land disposal was the purpose of and need for the agency action. Respondents questioned the validity of the stated purpose, noting that 1) the wash is not a currently naturally functioning area; 2) the area was selected for disposal in part because of the amount of development surrounding it; 3) the EA for the neighboring shooting park mentions nothing about the importance of preserving the natural hydrologic functioning of the area; and 4) it is defined so narrowly, it precludes any development in the area.

It was also indicated that if the stated purpose of the SEIS, "preservation of natural hydrologic functioning," means only exclusion of development in the wash itself, there was no reason to increase the CTA boundary from 5,000 to 11,000 acres. Respondents also questioned how the establishment of various administrative boundaries would actually meet the other stated purpose, protection of natural, cultural, and biological resources within the CTA.

Response

Although land disposal was part of the purpose for the LVVDB FEIS, the purpose of and need for the CTA SEIS is guided by the ROD, which required further study, collaboration, and analysis of the environmental effects of public land disposal within the CTA study area. The purpose and need is consistent with the LVVDB ROD. Section 1.3, Purpose and Need, of the Final SEIS currently states, "BLM's Proposed Action is to establish a final CTA boundary that is compatible with protecting natural, cultural, and biological resources and to facilitate orderly growth within the LVV that is consistent with the LVVDB ROD."

Protecting the natural hydrologic functioning of the wash is only part of the purpose for the BLM action. The purpose of and need for the action is usually related to achieving the goals and objectives of the RMP. The BLM NEPA Handbook states that "the 'purpose' can be described as a goal or objective we are trying to reach." Goals and objectives were defined for a final CTA boundary during stakeholder meetings in 2005. One goal was to "preserve the ecosystem of the Upper Las Vegas Wash in its natural state." Protection of the natural functioning of the ULVW addresses that goal. An analysis of impacts to resources, including cultural and biological resources present in the CTA study area, is presented in Chapter 4 of the Final SEIS. Those impacts were considered by the BLM in selecting the final Preferred Alternative.

Recreation (REC) 15 comments

Respondents indicated that the recreation analysis was insufficient and inaccurate for the following reasons:

1. The analysis generally only examines opportunities for "passive recreation," such as hiking. As a result, it assumes that lands disposed of would have no recreational opportunities, and recreation would only occur within the CTA. This assumption may be in conflict with approved land use plans, which do require recreation amenities. Similarly, the analysis does not consider the potential loss of recreational opportunities, such as urban parks, that could result from a limitation in the number of acres that could be developed.
2. The analysis does not define what a "substantial" reduction in recreation or what "sufficient opportunities for recreation" means.
3. The analysis does not incorporate the most recent data regarding current and proposed public trail systems and does not include the model park at McCool Park in its analysis.
4. The analysis includes a discussion of beneficial impacts from potential trails establishment and off-highway vehicle restriction within the CTA, although allowable uses are beyond the scope of the SEIS.
5. The analysis does not discuss potential impacts to recreation within the context of other available opportunities for recreation, such as proximity to the Desert National Wildlife Refuge (DNWR).

Response

There would be no loss of existing urban parks under any of the alternatives. Additionally, because of the proximity to the DNWR and the requirements of the Cities of Las Vegas and North Las Vegas to include parks as part of all new development, there would be no substantial loss of lands available for recreation uses under any of the alternatives. Sections 4.9.4 through 4.9.6 of the Final SEIS have been revised to include the recreation opportunities that would be developed associated with new private development, as required by the land use plans of the cities.

Socioeconomics (SOC) 75 comments

Population and Demographics

Data Revisions, Omissions, and Corrections

Respondents indicated that an update in economic statistics is needed because of the decline in the economy, which affects population, infrastructure needs, and construction activities. Respondents questioned the accuracy of some of the data or requested citations and also suggested that some of the data were not necessarily relevant, that the relevance was not well explained, or that the data could be better presented in another section of the document. Readers also indicated that some population figures were not consistent between Chapters 3 and 4.

Response

The Draft SEIS was prepared using the best available data at the time. The statistical information in socioeconomic Sections 3.13 and 4.13 of the Final SEIS has been updated to reflect more current citations, data, and information. The following has been added to the introduction of Section 3.13 of the Final SEIS:

> Since the SEIS process was initiated, social and economic circumstances in the LVV have changed as a result of the recent housing crisis and associated credit problems. There is uncertainty regarding how these circumstances will influence the Las Vegas economy and population in the near future. Statistics on current population and economic conditions have been updated in the Final SEIS where appropriate. However, even with these changing circumstances and current uncertainty, the best available data from the Nevada State Demographer continue to project strong population growth in the next 20 years (NSD 2008).

Data or Analysis Omissions

Respondents indicated that the analysis needs to be revised to include an analysis of the impacts from “leapfrog” development, including longer commute times, increased energy usage, etc., and recommended incorporating additional data regarding the economic costs of displaced development. It was also suggested that the acres available for development within each city’s boundaries be included in this section.

Response

The population and demographics analysis under the alternatives in the Final SEIS has been revised as follows:

> Under Alternative A, it is expected that approximately 9,010 individuals would occupy developable disposal lands at build-out (see Table 4.13-2). The change in rate of population

> growth is expected to occur independent of any changes in the disposal boundaries. The result, according to the Cities, is that leapfrog development would occur and there would be more inefficient placement related to utility construction and transportation infrastructure. If this were to occur, there would be a significant, direct, adverse impact to both cities as a result of Alternative A.

These changes are carried through each of the alternatives as necessary. The impacts of "leapfrog" development are also described in Section 4.14.13 of the Final SEIS, which discusses cumulative impacts to socioeconomics.

Community Services

Respondents requested additional clarification regarding infrastructure that would be allowed within the CTA. Respondents also indicated that impacts to schools are not adequately analyzed, failing to account for a loss of revenue to the General Education Fund from the sale of fewer disposal lands under Alternatives A and B and potential overcrowding from in-fill development that would occur without concurrent new school construction under those same alternatives.

Response

No decision on allowable uses or infrastructure in the final CTA boundary is being made through this SEIS. Allowable uses on BLM-managed lands can only be determined through the land use planning process. The consideration of allowable uses on lands in the CTA would be addressed through the current BLM Southern Nevada District's resource management planning process. Specific projects and actions associated with local plans could be implemented in parts of the CTA as long as they follow the BMPs and mitigation measures required by the Conservation Agreement that will be prepared for the final CTA.

The reduction of sale proceeds and SNPLMA funding for schools has been added to the analysis in the Final SEIS. The cumulative impacts to socioeconomics described in the Final SEIS include additional demands on public facilities and services, as well as on utilities and infrastructure.

Tax and Revenue

Respondents indicated that the section incorrectly presents data from the LVVDB FEIS as representing full build-out and suggested that additional analysis be augmented to present that information. Respondents also indicated that analysis does not disclose the amount of revenue the SNPLMA special account, Southern Nevada Water Authority, and General Education Fund would lose under alternatives with less acreage for disposal.

Response

Information from the LVVDB FEIS is presented only as an estimate of impacts for comparing alternatives. On page 221 of the Draft SEIS, the description of the information in Table 4.13-5 states,

> Unlike the economic analysis in the LVVDB FEIS, this analysis does not forecast a timeline for development. No timeline for development is included because development, by nature, is so speculative and uncertain; because there is no development timeline, no cumulative total of the economic impacts of a given alternative can be discussed. Rather, financial estimates are provided for annual impacts, at full build-out for each alternative.

The reduction of sale proceeds and SNPLMA funding has been added to the analysis in the Final SEIS.

Soils and Geology (SOI) 4 comments

Respondents indicated that the determination of significance of an impact requires a more quantitative definition than statements such as “substantially” and “result in modification.” Respondents also suggested that the establishment of some of the impact thresholds was outside the purview of the BLM.

Respondents indicated that the calculation of sediment load does not account for the application of the mitigation measures required by state regulation and or/local ordinances and, as such, does not reflect real conditions and should be reassessed.

Response

These thresholds identified for soils and geology were previously defined in the LVVDB FEIS that this document supplements. No change to those thresholds has been made.

Transportation (TRA) 40 comments, as well as form letter and form letter “plus” comments

Comments relating to transportation indicated that the analysis is flawed because it does not acknowledge key regional planning efforts; does not incorporate readily available and current data regarding planned infrastructure and current and projected population and traffic; does not fully disclose the assumptions used for analysis, including impact thresholds; and uses an insufficient region of influence in the analysis of impacts of infrastructure limitations within the CTA.

Readers indicated that the alternatives presented in the SEIS are in conflict with regional transportation plans and that this is not fully disclosed in the SEIS. Respondents also suggested that the alternatives should have been designed to allow for infrastructure connectivity across the CTA in a way that is consistent with locally adopted plans and to allow for long-term transportation solutions to east-west congestion in the northern part of the valley. These issues are also discussed in the Alternatives and Process sections of this document but are included below because they relate to the use of data and assumptions used for the transportation analysis.

Data Sources

Respondent comments indicated that the transportation analysis contained in the SEIS did not consider a number of current planning efforts and that the transportation section should be rewritten to incorporate available local information in the analysis of impacts. Respondents pointed to the RTC Regional Transportation Plan, Mountain Edge Parkway Feasibility Study, and a 2008 traffic model developed specifically for the SEIS as sources that should have been considered. Respondents also indicated that stakeholders had on several occasions provided data to the BLM regarding critical roadway and other infrastructure information but that this information was not incorporated into the SEIS. Respondents suggested that the above-mentioned sources would provide more recent traffic counts and better traffic projections than the Texas Transportation Institute (TTI) urban mobility report cited in the SEIS.

Response

Section 3.10 of the Draft SEIS is a description of the existing conditions in the area, not potential future conditions. Decisions on allowable uses, including transportation infrastructure, are not being made through this SEIS. Allowable uses are determined through the BLM land use planning process. Specific infrastructure needs would require site-specific NEPA analysis, would be considered on a case-by-case basis, and would be consistent with the requirements of the Conservation Agreement and BMPs identified by the BLM. The regional transportation needs in the RTC Regional Transportation Plan could be

implemented in parts of the final CTA consistent with the requirements of the Conservation Agreement that will be prepared for the final CTA boundary.

Section 3.10 of the SEIS has been revised to incorporate information from the current RTC Regional Transportation Plan. The Regional Transportation Plan is also included as a reasonably foreseeable future action for cumulative impacts in the Draft SEIS and states that "cumulative adverse impacts would be mitigated in the long term through implementation of elements of the RTC transportation plan, including additional road capacity, roadway improvements, congestion management programs, expanded transit options, and alternative forms of transportation, including pedestrian and bicycle (RTC 2006)." Additionally, the cumulative impacts to transportation have been revised in the Final SEIS to account for projected growth and traffic congestion using information from the current RTC Regional Transportation Plan and the 2008 Draft Traffic Demand Modeling for the CTA alternatives.

Insufficient Study Area

Respondents indicated that the CTA has the potential to impact traffic well outside the CTA area and suggested that the area of analysis was insufficient to fully disclose impacts from the CTA alternatives.

Response

Information from the RTC Regional Transportation Plan and the Traffic Demand Model for CTA Alternatives has been added to Section 4.10.2 to further characterize when a significant impact would occur to transportation and traffic. Section 4.10.2 of the Final SEIS now states,

> In a 2005 study, TTI concluded that significant changes in traffic resulted in 53 urban areas in which traffic growth was 30% greater or more than increases in road capacity (TTI 2005). Between 1982 and 2003, there was a consistent correlation across U.S. cities between population growth and increased traffic volume (TTI 2005). Although growth has slowed down, it has not stopped, and the RTC projects that future developments are likely to facilitate additional growth in the future (RTC 2008). In the long term, recent population forecasts indicate that by 2030, the LVV will support a population almost double its current size. This growth will result in an increased traffic volume on LVV roadways (RTC 2008). The vehicle-to-capacity ratio is used to identify high traffic congestion. When the vehicle-to-capacity ratio of a roadway is greater than one, the road is carrying more than it was designed to carry (Draft Travel Demand Modeling for CTA Alternatives). Ratios greater than one can lead to significant impacts to transportation and traffic.

Data Corrections

Respondents provided information regarding the existence of several paved roads within the CTA, a correction to the stated end point of the 215 Beltway, and an additional CTA access point that was not included in the SEIS.

Respondents indicated that some of the terminology used in this section, such as "local residential one-way," are not industry standard and suggested that planning-level descriptions from the Highway Capacity Manual would be a better source. Respondents also suggested using the American Association of State Highway and Transportation Officials (AASHTO) Green Book functional classification instead of a classification by roadway type.

It was also suggested that the SEIS should include data regarding alternative forms of transportation, such as existing and planned transit, bicycle, pedestrian, etc., into the analysis.

Response

Section 3.10.1 has been revised in the Final SEIS to clarify what sections of paved roads currently occur within the CTA study area. In addition, Table 3.10-1 of the Final SEIS has been revised to use the AASHTO Green Book for design standards and the "functional classification" instead of "roadway type."

The Regional Transportation Plan is also included as a reasonably foreseeable future action for cumulative impacts in the Final SEIS, which states that "cumulative adverse impacts would be mitigated in the long term through implementation of elements of the RTC Regional Transportation Plan, including additional road capacity, roadway improvements, congestion management programs, expanded transit options, and alternative forms of transportation, including pedestrian and bicycle (RTC 2006)."

Analysis Assumptions and Impact Indicators

Respondents indicated that it was impossible to fully understand the transportation analysis without providing additional information regarding the assumptions underlying the analysis.

Readers also indicated that a measure of congestion (level of service, or LOS) would serve as a better impact indicator average daily traffic (ADT), noting that under certain scenarios, congestion may decrease even if ADT increases.

Response

The Final SEIS has been revised to better describe the assumptions for analysis. Because Alternatives C through E include lands available for disposal and development north of the ULVW and the CTA boundary, although no decisions on allowable uses are being made in this SEIS, it is assumed there would be a need for additional infrastructure/roads crossing the CTA to access and service those lands.

The travel demand model for CTA alternatives was referenced to better describe impact indicators in the Final SEIS. The following was added to Section 4.10.2, Impact Thresholds: "Vehicle-to-capacity ratio is used to identify high traffic congestion. When the vehicle-to-capacity ratio of a roadway is greater than one, the road is carrying more than it was designed to carry (Draft Travel Demand Modeling for CTA Alternatives). Ratios greater than one can lead to significant impacts to transportation and traffic."

Vegetation Resources, Including Special-Status Species (VEG) 37 comments

General Vegetation

Readers pointed to some acreage inconsistencies and typographical errors relating to the acres contributing to the conservation of plant species and assumed disturbance areas affecting vegetation communities.

Respondents suggested that the SEIS analysis failed to analyze impacts to the half-ring milkvetch, a rare low-elevation species that has the potential to occur in the CTA and requested additional clarification regarding impacts to yucca and cactus, noting that impacts by acreage to these species were reported in a manner inconsistent with other vegetation types.

Response

The acreages and percentages are based on the assumptions for analysis within each alternative CTA boundary. Table 4.4-3 of the Final SEIS indicates assumed disturbance acreages within each alternative. The assumptions for analysis are further described in Section 4.4-1 of the Final SEIS.

The BLM appreciates any additional information regarding the location of special-status species on BLM-managed lands. The Draft SEIS was prepared using the best available data at the time and based on issues identified in the LVVDB FEIS, during internal BLM scoping, public scoping, and input from cooperating agencies. During site-specific special-status species surveys conducted for the LVVDB FEIS, the half-ring milkvetch was not identified, and it was not identified in the Biological Opinion issued for the LVVDB FEIS/ROD. Additionally, no records were found of occurrences in the CTA study area in the Nevada Natural Heritage Program database.

The third footnote in Table 4.4-3 of the Final SEIS discusses the vegetation community that includes cactus/yucca habitat. The text of Section 4.4 of the Final SEIS has been revised to include the total cactus/yucca habitat acres for each alternative boundary.

Special-Status Species

Respondents provided or offered to make available additional data related to Las Vegas bearpoppy and Las Vegas buckwheat locations for consideration in the analysis. Clarification was requested regarding potential habitat for these species in areas near the CTA.

Readers requested clarification of impact thresholds for these species noting that “net unmitigated loss of high-potential and occupied habitat” is not adequately defined. Readers also provided specific comments relating to each of the special-status species, particularly with regard to the mapped high-potential and occupied habitat.

Response

Potential habitat was determined using a combination of suitable vegetation and soil data to create a habitat type data set. The data set includes potential habitat polygons (unique vegetation and soil combinations) within the CTA study area. Occupied habitat was overlaid on the habitat type data set and queried to determine potential habitat. Potential habitat polygons adjacent to occupied habitat were determined to be high potential; the remaining potential habitat polygons were defined as moderate potential. All other areas were considered low potential and unlikely to support buckwheat or bearpoppy.

Unmitigated loss is loss of habitat outside the final CTA boundary on those lands that would be available for disposal and private development. Although the model may not accurately predict the occurrence of an individual plant, it does reflect available habitat based on the soil types and vegetation communities where known occurrences have been documented. It is for that purpose that it is applied. In addition, although the Nevada Division of Forestry has the authority to issue conditional take permits for the disturbance or destruction of Nevada critically endangered plant species; the agency may therefore issue a permit for take of Las Vegas bearpoppy, which would include mitigation to reduce the effects of development on bearpoppy; there would still be an unavoidable direct loss of habitat, which would be considered a significant impact to the species.

Visual Resources (VIS) 6 comments

Respondents suggested that the analysis methodology used in the Draft SEIS is inconsistent with that of the LVVDB FEIS and also indicated that some of the conclusions contained in the Draft SEIS regarding

visual impacts appear contradictory. Readers also expressed some confusion about how lands available for disposal would have significant impacts or how mitigation might be applied to lands for which allowable uses have not yet been identified. Mitigation pertaining to the ULVW interception berm was also called into question.

Response

The LVVDB FEIS threshold is as follows: "Development of private lands, such that VRM classifications on surrounding BLM lands could not be achieved or maintained would be a significant impact." This is consistent with the threshold identified in the SEIS: "When changes, or impacts, to the landscape do not meet this objective, they will be considered significant." Suggested mitigation measures are described and may be included in the Conservation Agreement and applied as appropriate to maintain the characteristic landscape of the CTA. These would not apply to existing facilities. The Final SEIS has been revised to clarify the purpose of including these mitigation measures.

Water Resources (WAT) 113 comments

General Comments

As discussed in Section 1.3, Purpose and Need, respondents requested clarification regarding the purpose of maintaining either current conditions or "natural functioning." Respondents differed in their opinion regarding whether the existing condition represents a "naturally functioning" condition. It was also suggested that existing condition is contributing to resource loss, and the stated goal of maintaining natural function or existing conditions was questioned.

Response

The phrase "natural functioning" is intended to refer to the current configuration of the wash and is defined in Section 1.1 of the Final SEIS as follows: "the natural functioning of the wash would include natural flows (both discharge and velocity), natural flood control, sediment transport, erosional processes (deposition and aggradation), and naturally occurring vegetation and habitat."

Scope of Analysis

Respondents indicated that the water resources analysis did not analyze adverse effects resulting from the inability of local governments to build facilities that would protect against flooding.

Response

Floodplains are discussed, in part, in Section 3.3.1 of the Final SEIS, which states, "Without further development, the wash has sufficient natural flood control capacity." The hydrology and erosion analysis was a comparative study intended to focus on potential impacts and changes to the hydrologic function of the wash, based on specific land use changes for each transfer alternative. The land use assumptions are outlined in the report, are included in the Appendix L of the Final SEIS, and were applied consistently among alternatives to produce a reasonable comparison of potential hydrologic impacts within the CTA. Existing detention basins, such as the Upper Las Vegas Wash Detention Basin (Decatur Detention Basin), and other significant flood control facilities within the CTA boundary were included in the analysis. The study was not intended to support a community master plan the CTA area.

Baseline Conditions

Respondents noted that the ULVW is not a natural channel and currently contains numerous detention basins and flood control structures, some of which are not included in the SEIS analysis or are incorrectly delineated.

Response

The ULVW in the CTA boundary is a naturally occurring drainage system that has been altered by several flood control facilities. Section 1.2 of the Draft SEIS states, "Although sections of the ULVW have been modified through flood control structures (e.g. detention basins), a large portion of the wash provides for natural flood control." The ULVW is referred to as a natural channel because it functions unimpeded by any significant human-made structure upstream of the diversion berm and because flood control facilities within the CTA boundary are not continuous or frequent. The structures referenced include a levee system in the 600-foot-wide ROW, which is included in the hydrology and erosion analysis, as well as the Decatur Detention Basin. Section 4.3.1 of the Final SEIS references the Decatur Detention Basin and the east-west-oriented diversion berm.

Hydrology and Erosion Analysis

Readers noted that the Draft SEIS does not contain sufficient information to replicate or properly evaluate the hydrologic analysis for accuracy. In analyzing the information that was provided, respondents indicated that the model requires revisions for a variety of reasons, including the following:

1. The model has faulty assumptions and inputs, which result in the overestimation of peak flows and sediment loss.
2. The model does not account for potential mitigation measures that would be applied as required in the Clark County Regional Flood Control District (CCRFCD), under the Hydrologic Criteria and Drainage Design Manual; or under other local, state, and federal stormwater control measures.
3. The model was not conducted to acceptable industry standards, was manipulated to accentuate differences between alternatives, and was not reviewed, approved, stamped, or signed by a Nevada registered civil engineer.

Readers also suggested the Draft SEIS does not fully explain the impact of sediment loss and why sediment loss should be considered significant. These issues are discussed in the subsections below.

Response

The work performed for the hydrologic analysis is comparative, and no design plans or specifications were prepared. The work was completed for a federal agency for comparison purposes only so that a rational, unbiased decision process could be implemented in evaluating various CTA boundary alternatives. The work and results are not intended to be used or published for use by local, regional, or statewide agencies.

Insufficient Data Provided

Respondents indicated that the SEIS does not disclose sufficient information to replicate the hydrologic analysis and that the BLM should revise the SEIS so that readers have sufficient information to understand the data and assumptions used in the analysis in order to be able to replicate the results. Additionally, readers noted that the output file supplied in the SEIS *predates* the input file and is incomplete.

Response

The hydrology and erosion analysis was comparative in nature, and the level of effort and detail was judged appropriate for the intended purpose of evaluating the alternatives and potential impacts to the natural functioning of the ULVW. Simplifications were made for the modeling effort because it was never the intent to perform modeling at a master planning or final design level; the modeling level of detail was applied consistently to all alternatives, along with sound engineering judgment and following the state-of-the-practice procedures appropriate for this type of effort. The relative model outcomes would not change significantly if the much greater level of detail requested by the commenter were employed. The model results provide a rational basis for assessment of alternatives to facilitate decision making. For brevity in the published report, pertinent computational material was included that was sufficient to allow a technical review appropriate for this comparative type of analysis.

Consideration of Planned Flood Control Structures

Respondents also indicated that additional structures are planned and that these facilities should be included in the analysis, in terms of peak flow calculation as well as conclusions drawn regarding the need for future facilities. Respondents cited the CCRFCD Master Plan Update (MPU) and City of Las Vegas Infrastructure Facilities Plan as examples of local planning documents related to flood control that were provided to BLM that were excluded from consideration.

Response

The comments imply that the master-planned drainage infrastructure will be built as shown in the MPU. That is often not the case, and it is impossible to know the details of how the final design of drainage infrastructure will eventually play out. The hydrology modeling approach used was simplified from what might be applied for a master planning or final design level effort but was appropriate for this type of comparative evaluation and was consistently applied to all alternatives.

Use of 100-year Flood Event

Respondents also indicated that the Draft SEIS inaccurately estimates current annual erosion potential from 100-year events.

Response

A probabilistic method was applied to weight sediment transport estimates with the associated flood-frequency probability. The method is described on page 9 of Appendix L in the Final SEIS. The 100-year peak flows are reported for comparative purposes because they represent a commonly used design frequency; however, the sediment losses reported refer to average annual losses.

Floodplain Determinations

Respondents also questioned the acreage reported for the floodplain for each alternative, stating that the acreage had been incorrectly determined from a standard channel cross section from the hydraulic model rather than from actual existing and proposed cross sections, and incorrectly assumed the Flood Zone would be allowed to increase under the various alternatives without showing compliance with Federal Emergency Management Agency (FEMA) and local code requirements.

Response

A Hydrologic Engineering Center River Analysis System (HEC-RAS) hydraulic model was developed for the ULVW channel within the CTA study area boundary. Digital contour mapping was obtained and

used to generate cross sections used in the model. Accepted hydraulic engineering practices were followed to develop a HEC-RAS model suitable for a comparative steady-state analysis for the alternatives. Model parameters such as channel roughness were based on observed conditions in the field. Downstream boundary conditions were obtained from accepted CCRFCD hydraulic models downstream and from known hydraulic controls. One useful output from the HEC-RAS model is the tabulation of areal floodplain coverage over the model length, which was given in Table 4.3-1 of the Final SEIS for this comparative analysis.

The intent of the Final SEIS hydraulic analysis was to provide a comparison of estimated floodplain areas between the various CTA alternatives. It was not intended to be a replacement for the current FEMA Flood Insurance Study and Flood Insurance Rate Map panels, nor was the intent to perform a hydraulic analysis at the same level of detail as required for a detailed FEMA hydraulic model. However, the hydraulic model was based on the existing configuration of the ULVW.

Consideration of Required Mitigation Measures in Analysis

Respondents indicated that the analysis must consider all required federal, state, and local regulations related to flood control measures in its analysis and that the analysis must be revised to include alternatives that meet all federal (FEMA) and local regulatory requirements, including the following:

1. Uniform Regulations for the Control of Drainage–City of Las Vegas Code Title 20.10, City of North Las Vegas Code Title 15.40, Nevada Revised Statutes 543 and approved by FEMA;
2. CCRFCD Hydrologic Criteria and Drainage Design Manual adopted by Uniform Regulations for the Control of Drainage; and
3. CCRFCD MPU: Required by NRS278 and NRS 543. Compliance required by City of Las Vegas Code Title 20.04 and City of North Las Vegas Code Title 15.42. MPU adopted by BLM ROD.

Respondents noted that the LVVBD FEIS did provide for mitigation in its analysis. Respondents also indicated that any mitigation measures included in the analysis must be applied to all alternatives equally and that in order to allow for comparisons, the SEIS should include the same measures as the Clark County Shooting Park EA.

Respondents also indicated that the conclusions regarding implementation of specific construction and post-construction BMP actions is questionable, given that those regulations are not in place.

Response

The analysis was not intended to anticipate final design level future development conditions, such as on-site stormwater mitigation, because the location, function, and capacity of those systems are not known and cannot be determined presently; rather, the analysis was a comparison of potential hydrologic impacts from land use changes in the CTA boundary.

Inaccurate or Inappropriate Model Inputs

Respondents indicated the hydrologic analysis presented by the Draft SEIS has not been prepared in accordance with good engineering practices and that a number of inputs used in the hydrologic model were not to Hydrologic Criteria and Drainage Manual standards or were inconsistent with FEMA-adopted methodology. Respondents cited a number of technical issues that would need to be addressed, including application of rainfall data; oversimplification of channel sections; use of inappropriate curve numbers; and other technical inaccurate or inappropriate inputs to the model. Respondents indicated that the BLM should revise the hydrologic analysis in the Final SEIS so that it conforms to the Hydrologic Criteria and Drainage Design Manual and circulate a revised draft for comment.

Response

The hydrologic and erosion analysis was comparative in nature and the level of effort and detail was judged appropriate for the intended purpose of evaluating alternatives and potential impacts to the natural functioning of the ULVW. While simplifications were made for the modeling effort, it was never the intent to perform modeling at a master planning or final design level as suggested. In addition, the analysis was not intended to anticipate final design level future development conditions, such as on-site stormwater mitigation, because the location, function, and capacity of those systems are not known and cannot be determined presently; rather, the analysis was a comparison of potential hydrologic impacts from land use changes in the CTA boundary.

The hydrology modeling effort was performed using a hydrology model accepted by the CCRFCD and provided as a starting point for the modeling. The model was truncated in size to focus comparative study results on the basins within the CTA boundary by removing extraneous basin areas that would tend to dampen overall results. That approach is well accepted in hydrology modeling practice, where it is well documented that storms of smaller areal size frequently occur over larger drainage basins, thus rendering significant portions of the larger basin noncontributing. A strict adherence to local criteria was not necessary because of the comparative nature of the analysis and the fact that the model was not intended to be used by the local municipalities or flood control authority.

Hydrology and Erosion Model Manipulation

Respondents suggested that some of the values and inputs discussed above were inconsistently applied to accentuate differences between the alternatives and that, as such, the study does not meet the requirements for scientific integrity and should be redone so that values and inputs are applied consistently to all alternatives.

Response

The results of the analysis were not skewed toward a single alternative; rather, all criteria used for determining curve numbers were applied consistently to all alternatives. The source document for the curve number procedure was the National Resources Conservation Service's (formerly Soil Conservation Service) Technical Release No. 55, which is a state-of-the-practice reference document for this type of analysis and is included in Section 605 of the CCRFCD Hydrologic Criteria and Drainage Manual. Also, recent soil data from the USU soils study were used in the analysis, which would also have the potential to affect curve number values.

Model Results

Respondents indicated that for the reasons discussed above, the analysis results are much too high and should be corrected. It was indicated that when models were corrected, the results are well below the limits reported in the Draft SEIS.

Response

While it may be possible to engineer facilities to manage no increase in flows for any level of development, there would be other consequences to the drainage system. For example, that the same peak flow would result from high density to essentially zero development suggests that a very significant portion of the runoff from high-density development has been detained and must be released. These types of steady releases have other consequences, such as channel erosion and headcutting. In addition, another consequence not addressed is the steady baseflow of water in the wash resulting from lawn sprinkling, car washing, and other types of outside domestic use, which can have detrimental impacts to the wash. We

believe these assumed mitigation efforts are oversimplified and that the nearly identical flows, regardless of the level of development, are not realistic.

SEIS Conclusions and Significance Determinations

In additional to issues with the hydrology model, readers also questioned the impact thresholds and significance determinations made in the Draft SEIS. As in many resource sections, readers requested quantification of terms such as “significant” or “substantial.” Readers suggested that the Draft SEIS does not fully explain the impact of sediment loss or why sediment loss should be considered significant.

Response

The term substantial is subject to interpretation. That is why the comparative analysis results are presented, so that an assessment can be made of the results for the various alternatives that will provide a rational basis for comparison and determination of significance and thus assist in the decision-making process. The general effect of large online detention facilities is to impound sediment-laden floodwaters and drop sediment out of that water, as velocities in the detention facility are sufficiently low to render the sediment transport capacity essentially nil. The relatively sediment-free water released from the pond (also referred to as “hungry water”) will then have a high capacity to transport sediment from the downstream channel, thus resulting in higher channel erosion potential.

Wildlife (WL), Including Special-Status Species 7 comments

Wildlife comments centered on the rationale and extent of the wildlife analysis contained in the SEIS. Some comments questioned why any wildlife analysis is included at all, since Chapter 1 indicates that those resources did not need supplemental analysis. Conversely, other respondents suggested that the wildlife analysis contained in the SEIS is inadequate.

Respondents also recommended additional data sources for use in the analysis.

Response

Because the BLM is not making a decision regarding allowable uses in the Final SEIS and there were no changes in the available data at the time that suggested a need to conduct further analysis, the analysis of impacts to wildlife, including migratory birds and other avian species, completed in the LVVDB FEIS was considered adequate, and supplemental analysis was determined not to be necessary.

The BLM appreciates the additional data regarding the location of special-status wildlife species on BLM-managed lands. The Draft SEIS was prepared using the best available data at the time. Any new data provided will be applied during the preparation of the Conservation Agreement, as appropriate.