This memo summarizes the technical analysis performed to verify the absence of any impact to the Mississippi River’s 100-year Base Flood Elevation (BFE) due to floodway fill within a portion of Lilydale Park.

**Description of Project**
The project consists of proposed grading improvements within Lilydale Park. This project will disturb an area within the park between River Station (RS) 182 and 184. The area being disturbed is 6.8 acres (RS 183 +/-). Approximately 59,000 CY of material is being excavated/filled. No material is being hauled into the Lilydale Park from an outside source.

**Technical Background**
Federal Emergency Management Administration (FEMA) floodplain information for the City of St Paul consists of floodplain maps used for flood insurance purposes called Flood Insurance Rate Maps (FIRMs). The effective maps for St Paul are dated April 2, 2003. These maps represent the current maps used by FEMA and other state agencies in evaluating flood boundaries for the City of St Paul. The FIRM for St Paul shows Lilydale Park within the floodplain and floodway of the Mississippi River.

**Procedure**
The HEC-RAS model created for the updated 2003 Mississippi River Floodplain Study was used to calculate the effect of the proposed grading improvements within the floodway. The HEC-RAS model was selected for purposes of this analysis, rather than the HEC-2 model created in the early 1970s, because it incorporates the most recent information available and utilizes a graphical interface which allows for less user input errors.

The cross sections (RS 182 -184) that are nearest to the disturbed areas were modified to simulate the effect of the existing conditions. The HEC RAS model was run under the existing conditions to develop the existing water surface elevation for this scenario. The cross sections (RS 182—184) were than modified to simulate the proposed grading plans for this area. The HECRAS model was then run under the proposed grading plan to determine the 100-year water surface elevations throughout the 2003 study reach.

**Results**
The results of the model are included in the attachments. “Hec-RAS Output Table” represents the original FEMA water surface elevations, the scenario using the existing conditions with the extra cross sections and the “proposed” scenario with the proposed grading. The proposed grading scenario model results show that the water surface elevations did NOT rise throughout the modeled cross sections.

Therefore, I conclude that the proposed grading improvements with Lilydale Park will not raise the 100-year flood elevation of the Mississippi River.
MINNESOTA “NO-RISE” CERTIFICATION

This is to certify that I am a duly qualified professional engineer licensed to practice in the State of Minnesota.

It is further to certify that the attached technical data supports the fact that the grading improvements to the Lilydale Park Marina proposed by the City of St. Paul in the summer of 2010 between River Stations 182 and 184 within Lilydale Park will not impact the floodway width or 100-year flood elevation (will not raise by more than 0.00 feet) on the Mississippi River at published sections in the Flood Insurance Study for the City of St. Paul dated April 2, 2003 (FIRM date), and will not impact the 100-year flood elevation (will not raise by more than 0.00 feet) at unpublished cross-sections in the vicinity of the proposed development / project.

Attached are the following documents that support my findings:
Technical findings memo which includes maps showing the temporary stockpile location, modeled river cross sections, and HEC-RAS output.

Date: July 9, 2010

Name: Stan Hanson
Signature: [Signature]
Title: Project Engineer

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Registered Professional Engineer under the laws of the State of Minnesota.

Stan Hanson
Date: July 9, 2010  Registration No.26592
LILYDALE REGIONAL PARK ENVIRONMENTAL CLEAN UP 2010

ALICE MESSER
LANDSCAPE ARCHITECT

DARREN AMUNDSEN
PROJECT ENGINEER

JOHN CHOI
ATTORNEY

RICH LALLIER
PUBLIC WORKS DIRECTOR
NOTES:
1. PERFORM ALL EXCAVATION AND MATERIAL HANDLING OPERATIONS IN ACCORDANCE WITH THE RESPONSE ACTION PLAN (RAP) AND THE CONSTRUCTION CONTINGENCY PLAN (CCP).
2. SALVAGE EXISTING TOPSOIL. RESTORE ALL DISTURBED AREAS WITH MINIMUM 12" SALVAGED TOPSOIL AND SEED AS SHOWN ON C2.03.
3. ALL TREES AND STUMPS WITHIN THE EXCAVATION/GRADING LIMITS ARE TO BE COMPLETELY REMOVED UNLESS OTHERWISE NOTED. PROTECT ALL TREES OUTSIDE OF THE EXCAVATION/GRADING LIMITS AS WELL AS OTHER TREES AS SPECIFIED IN THE PLANS AND AS DIRECTED BY OWNER'S REPRESENTATIVE IN THE FIELD. SEE SHEET C8.01 FOR TREE PROTECTION DETAIL. TO BE INSTALLED AFTER ANY REQUIRED EXCAVATION ACTIVITIES.
4. IF DESIGNATED TREES ARE DAMAGED FROM EXCAVATION ACTIVITIES, TREE SHOULD BE REMOVED AS DIRECTED BY THE OWNER'S REPRESENTATIVE. LUMP SUMP BID SHOULD INCLUDE ALL WORK ASSOCIATED WITH EITHER REMOVING OR PROTECTING SPECIFICALLY IDENTIFIED TREES.
5. DISPOSAL OF TREES AND STUMPS SHALL BE OUTSIDE OF THE PROJECT AREA AND IS THE RESPONSIBILITY OF THE CONTRACTOR.
6. MAINTAIN A 30' VEGETATIVE BUFFER BETWEEN THE EDGE OF THE RIVER AND THE CONSTRUCTION OPERATIONS.
7. LILYDALE ROAD IS A DAKOTA COUNTY 9 TON ROADWAY. LEGAL TRUCKING LIMITS WILL APPLY, UNLESS OVERSIZED VEHICLE PERMIT IS PURCHASED. LILYDALE ROAD MAY BE USED FOR TWO-WAY HAULING. ANY DAMAGE DONE TO EXISTING ROAD AS A RESULT OF THIS PROJECT SHALL BE REPAIRED BY CONTRACTOR UPON COMPLETION OF HAULING ACTIVITIES. SEE SHEET C8.01 FOR TYPICAL SECTIONS. ROAD REPAIRS, INCLUDING STRIPING, ARE INCIDENTAL TO THE PROJECT.
8. SAWCUT ALL BITUMINOUS EDGES ADJACENT TO REPAIRED SECTIONS.
9. SALVAGE AND REINSTALL EXISTING GUARDRAIL TO PROVIDE ACCESS TO THE SITE. ANY GUARDRAIL DAMAGED DURING THE PROJECT SHALL BE REPLACED BY THE CONTRACTOR. GUARDRAIL REPLACEMENT/REINSTALLATION IS INCIDENTAL TO THE PROJECT.
10. EXCAVATE WITH IN THE CONSTRUCTION LIMITS TO ELEVATION 700±. PROCESS, CRUSH, AND BLEND TO A WELL GRADED 2" MINUS STOCKPILE.
RS = 183.2    New X -Section

Legend
EG 100 YR
WS 100 YR
Crit 100 YR
Ground
Ineff
Bank Sta
RS = 183.1
New X-Section

Legend
EG 100 YR
WS 100 YR
Crit 100 YR
Ground
Ineff
Bank Sta
Revised Final Fwmod Ex 2010_07 Plan: Imported Plan 01 7/8/2010

RS = 183  New X-Section

Legend

EG 100 YR
WS 100 YR
Crit 100 YR
Ground
Ineff
Bank Sta
RS = 182.9  New X -Section

Legend

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- WS 100 YR
- Crit 100 YR
- Ground
- Ineff
- Bank Sta
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Note: FEMA W.S. elev (ft) - Elevation as calculated in the DNR Model; Existing W.S. Elev (ft) is calculated using the inputed cross sections at existing ground elevations; Proposed W.S. Elev (ft) is calculated using the inputed cross sections at the proposed ground elevations.