Exhibit 7

From:	Dana Sheahen [dana@shellengr.com]
Sent:	Tuesday, July 06, 2010 2:30 PM
To:	Will, Matt
Cc:	Patel, Minesh; Lagomarsino Kimberly S; Charles Shell
Subject:	Mississippi Lime Prairie du Rocher NO2 1-hr Modeling
Attachments:	PrairieduRocher_Modeling Results NO2 1-hr_070210.pdf; POST PROCESSING METHOD.pdf

Hello Matt,
Attached is the report for the NO2 1-hr modeling for the Mississippi Lime Prairie du Rocher Project. We are shipping a hardcopy to you tonight along with a hard drive that contains all of the modeling files, POSTFILES, and database queries discussed in the documents. Please let me know if you have any questions.

Dana Sheahen
Project Engineer
Shell Engineering & Associates, Inc.
573-445-0106

Modeling Supplement

One-hour NO_2
Ambient Air Quality Impact Analysis
– Prairie du Rocher Lime Plant

July 2, 2010

Prepared By:
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2403 West Ash
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1.0 Project Description

Mississippi Lime Company (MLC) has previously submitted a PSD permit application for a proposed lime plant to be located approximately 1.5 miles northwest of Prairie du Rocher. MLC has revised the air quality modeling to assess the new federal 1-hour NO$_2$ standard of 188 μg/m³.

To assess the NO$_2$ 1-hour standard, modeling analysis was performed in accordance with guidance on methodology from the EPA found in the *Notice Regarding Modeling for New Hourly NO$_2$ NAAQS*, EPA, February 25, 2010[1].

No Significant Impact Level (SIL) is currently available for 1-hour NO$_2$. Therefore, a radius of 50km from the proposed source was used to define the Significant Impact Area (SIA).

Full impact NAAQS analysis was accomplished using NO$_2$ source inventories from Missouri and Illinois that lie within a 100km radius of the proposed source (SIA + 50km) and meeting the (Q>10D or D<5km) screening criteria. Missouri sources were provided by Missouri Department of Natural Resources (MDNR) and Illinois sources were provided by the Illinois Environmental Protection Agency (IEPA).

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[1] Notice Regarding Modeling for New Hourly NO2 NAAQS dated February 25, 2010
http://www.epa.gov/scram001/no2_hourly_NAAQS_aermod_02-25-10.pdf

2.0 Model Description

The air quality modeling for this project was accomplished using the AERMOD dispersion modeling system. The AERMOD system was developed by AERMIC, a collaboration of the American Meteorological Society (AMS) and the U.S. Environmental Protection Agency (EPA). The AERMOD system is a steady-state plume model that incorporates air dispersion based on planetary boundary layer (PBL) turbulence structure and scaling concepts, including treatment of both surface and elevated sources, both simple and complex terrain.

In addition to the dispersion model itself, referred to simply as AERMOD, the AERMOD system includes two regulatory component pre-processors for meteorological and terrain data which will be used. The meteorological component, AERMET, processes commercially available surface and upper air hourly meteorological data to produce profile and surface files that characterize the PBL for the dispersion model. The terrain data component, AERMAP, processes USGS Digital Elevation Model (DEM) data to calculate elevations as well as a representative terrain-influence height associated with each receptor location.

The AERMOD version used was the same one that was used in the original modeling for the Prairie du Rocher PSD project: AERMOD version 07026.

2.1 Model Control Option Selection

The DFAULT and CONC model control options were utilized. The DFAULT option specifies that only regulatory default options will be allowed and the CONC

option specifies that pollutant concentrations will be calculated. The default RURAL classification was used for this proposed facility.

2.2 Model Input Parameters

Point sources were used to model emissions from the two stacks for the lime plant. These were the only two sources associated with the project. The emission rates and stack parameters are shown in Table 4-1.

2.3 Downwash Characterization

The Building Profile Input Program with PRIME (BPIPPRM) was used to calculate direction specific building profile data. Since the sources will be located in close proximity to a number of buildings at the facility, building downwash will affect the dispersion of the plume. The degree downwash affects the plume depends on the size and orientation of the buildings close to the stack. Every significant building/structure at the facility was included in the analysis for estimating downwash.

2.4 Receptor Selection

Receptors were placed at 50m intervals around the main property boundary surrounding the kiln and along Bluff Road which divides the property on the southwest side. Outside the perimeter, a grid of fine Cartesian receptors extending 5km in each direction from the Kiln #1 stack, with receptors placed every 0.5km. A course receptor grid was extended to 50km in each direction from the Kiln #1 stack with receptors placed every 1km. This resulted in a total of 8256 receptors.

The terrain elevations and hill heights were calculated for each receptor using AERMAP (AERMOD's terrain pre-processor) and USGS Digital Elevation Model (DEM) data.

2.5 Meteorological Data

The meteorological data was a compilation of surface and upper air data using the AERMET (AERMOD's meteorological preprocessor). The closest meteorological station to the site is at the St Louis airport, located approximately 37 miles north of the proposed facility. Surface data from this location was purchased from the National Climatic Data Center (www.ncdc.noaa.gov/oa/ncdc.html). Upper Air data from Lincoln, Illinois, located approximately 150 miles north of the site, was obtained from Forecast Systems Laboratory Radiosonde Database Access (http://raob.fsl.noaa.gov).

The meteorological study period will consist of the 5-year period between January 1, 2002 and December 31, 2006.

3.0 NO_2 / NOx Speciation

Three tiers were available in determining the NO_2 concentration based on the modeling of NOx emissions:

1. Initially, 100% conversion of the NOx to NO_2 will be assumed.
2. Recent guidance from IEPA has recommended a 0.90 ratio NO_2/NOx due to unavailability of monitoring ratios other than 1.
3. If necessary, state agency ozone information will be requested and the Plume Volume Molar Ratio Method (PVMRM) option of AERMOD will be used to calculate the conversion.

4.0 Model Results

4.1 Preliminary Impact Analysis

An analysis was run to assess the impact of the proposed source by itself. The model was run with all 8256 receptors, and POSTFILES were created for all five model years of hourly results at each of the 8256 receptors.

The POSTFILES were then post processed to determine NO$_2$ 1-hr impact level, using the following procedure from the guidance:

1. Run AERMOD for each of five years, retaining hourly concentrations at each receptor for each hour using the hourly POSTFILE option.
2. From the POSTFILE output, determine the maximum 1-hour concentration for each receptor, for each day.
3. At each receptor, for each year modeled, determine the 8th-highest daily 1-hour maximum concentration from the 365 or 366 day period.
4. At each receptor, average the 8th-highest daily highs from each of the five model years.
5. The design value for 1-hour NO$_2$ is the highest of the five-year averaged 8th-highest daily highs

Due to the large amount of data generated, implementation of the process for post processing was accomplished using the MS SQL Express 2008 R2 Database Server from Microsoft[2], along with queries developed by Shell Engineering & Associates for this purpose. The queries were used to import and manipulate the data points per guidance. A description of the procedure titled **POST PROCESSING 1-HOUR AIR DISPERSION MODELS WITH SQL QUERIES** is attached.

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[2]MS SQL Express 2008 R2 Database Server – free version
http://www.microsoft.com/express/database/

The query files are provided separately with the other model files and POSTFILEs.

The modeled design value for the two kilns, accounting for the NO_2 speciation using Tier 1, was 55.5µg/m³. The high receptor location and yearly 8th daily high averages at the receptor are shown in Table 4-2.

4.2 NO_2 1-hr Ambient Background Value

The NO_2 ambient background value is based on the highest hourly value measured at the St. Clair County, IL monitoring site at 13th and Tudor in East St. Louis, IL. The maximum value was 62ppb which equates to 117µg/m³.

4.3 Class 2 Increment Analysis

The EPA has not established an increment value for 1-hr NO_2.

4.4 Full Impact Analysis

Full impact NAAQS analysis included NO_2 source inventories from Missouri and Illinois that lie within a 100km radius of the proposed source (SIA + 50km) and meeting the (Q>10D or D<5km) screening criteria. Missouri sources were provided by Missouri Department of Natural Resources (MDNR) and Illinois sources were provided by the Illinois Environmental Protection Agency (IEPA).

The procedure used to calculate the predicted impact level for all outside sources plus the lime plant project sources was identical to the one described in section 4.1. The modeled design value for the two kilns plus all outside inventory sources, accounting for the NO_2 speciation using Tier 1, was 4356.8µg/m³.

Given a predicted concentration above the NAAQS limit of 188μg/m³, the next step was to determine if the lime plant PSD project contributed significantly to the exceedence of the standard at the exact time and location where the exceedence was predicted by modeling. A Culpability Analysis was run, using database query methods, to remove from consideration all hours at individual receptors where the lime plant project was predicted to contribute less than 9μg/m³. This culpability threshold was approved by IEPA and EPA Region V. The database query method used in the Culpability Analysis is provided in the attachment titled **POST PROCESSING 1-HOUR AIR DISPERSION MODELS WITH SQL QUERIES.**

The predicted high concentration after the Culpability Analysis, again using the Tier 1 speciation, was 59.5μg/m³. A further refinement of receptors around the peak was defined with spacing of 100m apart within a 1km x 1km square. The model was run again with these receptors, and yielded a predicted high concentration after Culpability Analysis of 65.1μg/m³. The high receptor location and yearly 8th daily high averages at the receptor are shown in Table 4-3.

The final predicted concentration of NO$_2$, again using the Tier 1 speciation, was 65.1μg/m³. Adding a background value of 117μg/m³ results in a total of **182.1μg/m³**, which is less than the NAAQS standard of 188 μg/m³. A summary is shown in Table 4-4.

Modeling Supplement for One-hour NO_2
Prairie du Rocher Lime Plant

Table 4-1 Stack Parameters - NO_2 1-hr Model

Source ID	Source Emission (g/s)	Easting (UTM-m)	Northing (UTM-m)	Elevation (m-asl)	Stack Height (m) Above Grade	Stack Gas Exhaust Temp. (K)	Stack Gas Exit Velocity (m/s)	Stack Inner Diameter (m)
CD06	2.21E+01	753010	4220534	124.97	76.2	484	17.78	2.13
CD07	2.21E+01	753002	4220550	124.97	76.2	484	17.78	2.13

Table 4-2 Model predicted NO_2 1-hr high for proposed plant

High Receptor Location		Yearly 8th Highs					High Average
Easting	Northing	NOx 2002 8th High ug/m3	NOx 2003 8th High ug/m3	NOx 2004 8th High ug/m3	NOx 2005 8th High ug/m3	NOx 2006 8th High ug/m3	NOx 5-yr Average ug/m3
753028.9	4221609	55.6	54.1	54.3	57.5	56.0	55.5

Table 4-3 Model predicted NO_2 1-hr high for all sources after refinement

High Receptor Location		Yearly 8th Highs					High Average
Easting	Northing	NOx 2002 8th High ug/m3	NOx 2003 8th High ug/m3	NOx 2004 8th High ug/m3	NOx 2005 8th High ug/m3	NOx 2006 8th High ug/m3	NOx 5-yr Average ug/m3
753706	4220532	62.4	60.6	68.2	69.5	64.8	65.1

Table 4-4 Predicted full impact NO_2 1-hr summary

Prairie du Rocher Lime Plant Project Modeled 1-hr NO2 Concentration Values (µg/m³)					
Lime Plant Only	Lime Plant + Inventory before Culpability Analysis	Lime Plant + Inventory after Culpability Analysis	Ambient Background	Total Predicted Concentration	NAAQS
55.5	4356.8	65.1	117	182.1	188

POST PROCESSING 1-HOUR
AIR DISPERSION MODELS WITH
SQL QUERIES

PROCEDURES FOR DETERMINING HOURLY MODEL DESIGN
VALUES AND HOUR-BY-HOUR CULPABILITY COMPARISONS
USING AERMOD POSTFILES AND MICROSOFT SQL SERVER

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OVERVIEW

The recent updates to the National Ambient Air Quality Standards (NAAQS) include 1-hour standards for Nitrogen Dioxide (NO_2) and Sulfur Dioxide (SO_2). Consequently, the federal Prevention of Significant Deterioration (PSD) requirements now include 1-hour averaging modeling for preliminary and full impact analysis for these criteria pollutants. Although the current version of the air dispersion model, AERMOD, dated October, 2009, provides 1-hour averaging results, the current model does not further determine highest daily 1-hour concentrations, nor does it address comparisons on an hour by hour basis for a Culpability Analysis in the event that predicted concentrations in a full impact analysis are greater than the NAAQS. In both cases, post-processing of hourly results for each receptor is necessary, using the POSTFILE option in AERMOD modeling. The post-files produced include predicted concentrations for every hour at each receptor for the modeled period, which is assumed to be five years. In some cases, very large post-files are generated in this process. For example, five years of data for 1000 receptors results in 43,800,000 data points, or approximately 5GB (gigabytes) of formatted text. To manage the post-processing, a method using the Microsoft SQL database server and queries was developed by Shell Engineering. This report presents two related implementation procedures using AERMOD post-files and MS SQL queries.

The first procedure, explained in the **Determining Hourly Model Design** Value section, analyzes one set of five yearly post-files, to determine the daily high hourly average for each day and receptor. The procedure then allows the user to designate which "nth" high value should be selected for each receptor and averaged across the five years.

The second procedure, explained in the **Hour by Hour Culpability Comparison** section, analyzes two sets of five yearly post-files. One set, the "source post-files", consists of hourly data points produced by modeling the PSD source only, while the second set, the "full post-files", consists of hourly data points produced by modeling the PSD source with all outside source inventories included. If the predicted concentration with all sources is above the NAAQS, PSD policy is to then determine if the PSD project contributes significantly to the high events at the exact times and locations predicted by the modeling. In other words, it is necessary to compare each of the high hour/receptor combinations predicted during modeling and listed in the "full post-files" to the values predicted by the same hour/receptor combinations and listed in the "source post-files". The procedure outlined here allows the user to set a significance threshold for the hourly values. Any hour/receptor combination below the threshold in the "source post-files" will cause the corresponding hour/receptor in the "full post-files" to be ignored. The procedure can then continue with queries to find the "nth" high value and five-year average with insignificant hour/receptors ignored.

Query files developed by Shell Engineering and provided separately are needed to run the procedures described.

SETTING UP THE SOFTWARE

The following steps are required for both of the post-processing procedures described. Use of a PC computer with Windows XP or later and capable of running the MS SQL server is assumed.

STEP 1 – INSTALL THE MICROSOFT SQL SERVER

If the MS SQL server is not already available, install the free version, Microsoft SQL Server 2008 R2 Express with Management Tools, available in both 32-bit and 64-bit versions at http://www.microsoft.com/express/database/. The SQL 2008 R2 Express version allows up to 10GB database storage, while previous Express versions allow up to 4GB database storage. Note that this is not the size of the post-files produced by the AERMOD model, but rather the size of active tables in the database. The "with Management Tools" version includes Management Studio Express, which is the user interface needed to run the queries.

STEP 2 – CREATE THE MODELING DIRECTORIES

A directory named `DBMODEL` is provided. Copy this directory and all its subfolders and files to the C: drive of the PC on which the server is installed. The default paths to the post-files and format files used in the queries will find files in this location. However, advanced users can modify the queries with different paths if necessary. Once copied, the user should find the following directories on the PC:

```
C:\DBMODEL\Projects\HR_ANALYSIS\
C:\DBMODEL\Projects\CULP_ANALYSIS\
C:\DBMODEL\Projects\FORMATS\
C:\DBMODEL\SOURCE_POSTFILES\
C:\DBMODEL\FULL_POSTFILES\
```

The `Projects` directories contain queries and format files while the `SOURCE_POSTFILES` and `FULL_POSTFILES` directories will be used to house the actual POSTFILE results from AERMOD for processing.

DETERMINING HOURLY MODEL DESIGN VALUE

The following step-by-step procedure will determine the "nth" high value for a set of hourly results over five years and average them to produce the hourly modeled design value.

STEP 1 - CREATE THE POST-FILE SET

Run the AERMOD model one year at a time over five years of meteorological data. For each year, set the POSTFILE option to produce post-files of hourly results. An example is shown below:

```
OU STARTING
OU POSTFILE 1 ALL PLOT X102.PLT
OU FINISHED
```

Name each of the five files a different name. By default, the five files are assumed to be named `X102.PLT`, `X103.PLT, X104.PLT, X105.PLT`, and `X106.PLT`. Move the post-files created by AERMOD execution to the directory `C:\DBMODEL\FULL_POSTFILES\`.

Important: Each of the five post-files is assumed to have been produced by modeling exactly the same receptors in exactly the same order.

STEP 2 - CONNECT TO THE SERVER

Open SQL Server Management Studio, the user interface to the database server, and connect to the server. If using Windows Authentication, the login will look something like this:
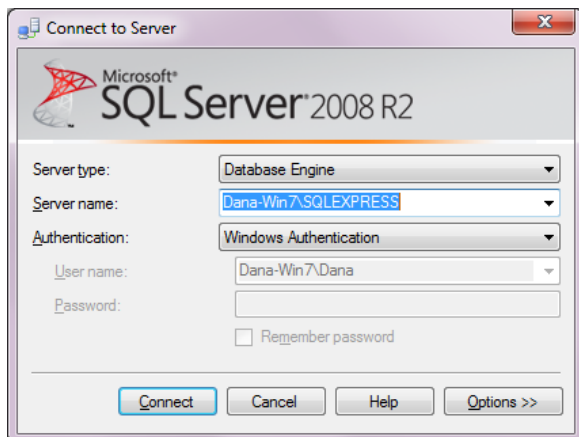
STEP 3 – CREATE THE [HOURLYDB] DATABASE

Once Management Studio is connected, right click "Databases" in the Object Explorer and select "New database". Type the name "HOURLYDB" and click "OK".

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STEP 4 - OPEN THE HR-ANALYSIS QUERIES

Open all Queries found in the C:\Projects\HR_ANALYSIS directory:

Q1_createfiles.sql – executing this query will delete any existing tables used by the queries in the procedure database and replace them with new empty tables.

Q2_HRimportflat.sql – executing this query imports the five post-files created by AERMOD; this is the most time-consuming query.

Q3_rankdays.sql – executing this query will create a table of ranked daily highs, where each daily high is the highest 1-hour concentration found across the 24 hours of data for that date and receptor.

Q4_getresults.sql – executing this query will create a table named RESULTS which contains the yearly "nth" high for each receptor and its 5-year average, ordered from highest to lowest. The user may set "n", which is the variable @RANKNUM by modifying the following line in the query, and MUST set the years to match the five meteorological years used in the model.

```
SET @RANKNUM = 8; /* set 8 for 8th highs, 4 for 4th highs, etc. */
SET @YR1 = 2; /* set years to match 2-digit years in model */
SET @YR2 = 3;
SET @YR3 = 4;
SET @YR4 = 5;
SET @YR5 = 6;
```

Q5_display.sql – executing this query will display the RESULTS table created in Q4.

STEP 5 - VERIFY QUERY POST-FILE PATHS AND VARIABLES

The query file **Q2_HRimportflat.sql** contains path references to each of the post-files produced by AERMOD. Verify that each path is correct. In addition, verify the path for the format file **PLTformat_hr.fmt** in the same query.

As discussed in **Step 4 - Open the HR-ANALYSIS Queries**, verify that the variables in **Q4_getresults.sql** have been set to the desired "nth" rank number (variable @RANKNUM) and that the meteorological years are the same as those in the model and post-files (variables @YR1, @YR2, @YR3, @YR4, @YR5). The default "nth" value is 8 and the default years are 2002, 2003, 2004, 2005, and 2006, which are represented by their two-digit year value as 2, 3, 4, 5, and 6 respectively.

STEP 6 - EXECUTE THE QUERIES

In order, execute each query: Q1, Q2, Q3, Q4, and Q5. The results grid will be displayed and can be copied and pasted to text or a spreadsheet.

If an error occurs, re-check the steps and assumptions provided above. It may be helpful to start with a model that only includes a few receptors to be sure the queries are working properly.

If there are a large number of receptors, the Q2 query may take several hours to complete.

If calculation of a new "nth" value is desired, @RANKNUM in Q4 can be set to a different value as described in **Step 4 - Open the HR-ANALYSIS Queries** and Q4 and Q5 can be re-run in order without starting over with the other queries. Q5 can be run again at any time. The results grid can be copied and pasted to text or a spreadsheet.

HOUR BY HOUR CULPABILITY COMPARISON

The following step-by-step procedure will determine the "nth" high value for a set of hourly results over five years and average them to produce the modeled design value, **after all hours that are insignificant for the PSD source have been ignored**. In this procedure, both the "source post-files" set and "full post-files" set are imported into the database and compared. Each hourly result from the "source" that is under the threshold of significance set by the user causes the corresponding "full" hourly result from the exact same time and place to be ignored. Calculation of the highest daily hourly concentration of the remaining significant hours for each receptor then proceeds exactly as in the **Determining Hourly Model Design Value** procedure. The calculation of the "nth" value and 5-year averaging is also the same.

STEP 1 - CREATE THE SOURCE POST-FILE AND FULL POST-FILE SETS

Run the AERMOD model one year at a time over five years of meteorological data. For each year, set the POSTFILE option to produce post-files of hourly results. Create one set of post-files for the PSD source only ("source post-files") and another set of post-files that includes the PSD source as well as outside inventory ("full post-files"). An example is shown below:

```
OU STARTING
OU POSTFILE 1 ALL PLOT X102.PLT
OU FINISHED
```

Name each of the five files in each set a different name. By default, the five files are assumed to be named `X102.PLT, X103.PLT, X104.PLT, X105.PLT,` and `X106.PLT` in both sets. Move the "full post-files" set into the directory `C:\DBMODEL\FULL_POSTFILES\`. Move the "source post-files" set into the directory `C:\DBMODEL\SOURCE_POSTFILES\`.

Important: Each of the ten post-files (both sets) is assumed to have been produced by modeling exactly the same receptors in exactly the same order.

STEP 2 - CONNECT TO THE SERVER

Open SQL Server Management Studio, the user interface to the database server, and connect to the server. If using Windows Authentication, the login will look something like this:
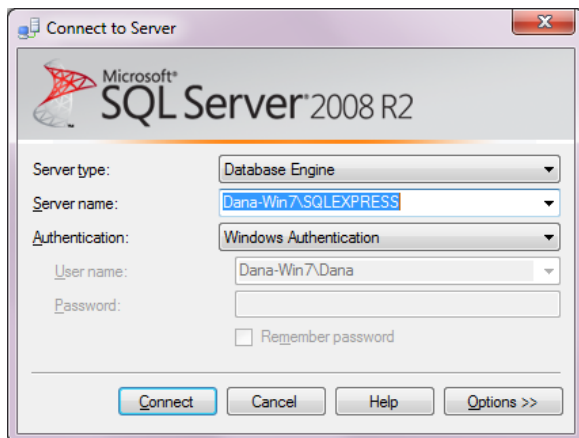
STEP 3 – CREATE THE [CULPDB] DATABASE

Once Management Studio is connected, right click "Databases" in the Object Explorer and select "New database". Type the name "CULPDB" and click "OK".

STEP 4 - OPEN THE CULP_ANALYSIS QUERIES

Once Management Studio is connected, open all Queries found in the `Projects\CULP_ANALYSIS` directory:

Q1_createfiles.sql – executing this query will delete any existing tables used by the queries in the procedure database and replace them with new empty tables.

Q2_CULPimportflat.sql – executing this query imports the five "source post-files" and the five "full post-files" created by AERMOD; this is the most time-consuming query. . The user may set the significance threshold for concentration values to exclude, which is the variable `@THRESHOLD`, by modifying the following line in the query:

```
SET @THRESHOLD = 9; /* 1-hour source contribution SIL */
```

Q3_rankdays.sql – executing this query will create a table of ranked daily highs, where each daily high is the highest 1-hour concentration found across the 24 hours of data for that date and receptor.

Q4_getresults.sql – executing this query will create a table named RESULTS which contains the yearly "nth" high for each receptor and its 5-year average, ordered from highest to lowest. The user may set "n", which is the variable `@RANKNUM` by modifying the following line in the query, and MUST set the years to match the five meteorological years used in the model.

```
SET @RANKNUM = 8; /* set 8 for 8th highs, 4 for 4th highs, etc. */
SET @YR1 = 2; /* set years to match 2-digit years in model */
SET @YR2 = 3;
SET @YR3 = 4;
SET @YR4 = 5;
SET @YR5 = 6;
```

Q5_display.sql – executing this query will display the RESULTS table created in Q4.

STEP 5 - VERIFY QUERY POST-FILE PATHS AND VARIABLES

The query file ***Q2_CULPimportflat.sql*** contains path references to each of the post-files produced by AERMOD. Verify that each path is correct. In addition, verify the path for the format files ***PLTformat_hr.fmt*** and ***PLTformat_skipZ.fmt*** in the same query.

As discussed in **Step 4 - Open the CULP_ANALYSIS Queries**, set the significance threshold value (`@THRESHOLD`) in the ***Q2_CULPimportflat.sql*** query to the desired value. The default value is 9.

Verify that the variables in ***Q4_getresults.sql*** have been set to the desired "nth" rank number (variable `@RANKNUM`) and that the meteorological years are the same as those in the model and post-files (variables `@YR1`, `@YR2`, `@YR3`, `@YR4`, `@YR5`). The default "nth" value is 8 and the default years are 2002, 2003, 2004, 2005, and 2006, which are represented by their two-digit year value as 2, 3, 4, 5, and 6 respectively.

STEP 6 - EXECUTE THE QUERIES

In order, execute each query: Q1, Q2, Q3, Q4, and Q5. The results grid will be displayed and can be copied and pasted to text or a spreadsheet.

If an error occurs, re-check the steps and assumptions provided above. It may be helpful to start with a model that only includes a few receptors to be sure the queries are working properly.

If there are a large number of receptors, the Q2 query may take several hours to complete.

If calculation of a new "nth" value is desired, `@RANKNUM` in Q4 can be set to a different value as described in **Step 4 - Open the CULP_ANALYSIS Queries** and Q4 and Q5 can be re-run without starting over. Q5 can be run again at any time.

If a new significance threshold is desired, `@THRESHOLD` in Q2 must be set to a different value and the sequence of queries re-run beginning with Q1 to ensure that all tables have been reset.