Chemistry

**Software Quality Assurance**

**SQA Implementation**

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| **Revision Number** | **Revision Date** | **Author** | **Summary of Changes** |
| 1 | 4-17-2013 | John Gibbons | Initial creation of document and draft. |
| 2 | 4-19-2013 | John Gibbons | Second revision of draft and added additional items. |
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# Documentation:

* Have all standards and guidelines been identified?
* Were any changes made to the implementation document?
* Have any rules been added for the initial implementation document?
* Is there a cover sheet and table of contents?
* Is there revision control?
* Has the implementation strategy been approved?
* Has all requirements been conformed with the client?
* Has the design documentation been approved?
* Has the design checklist been performed?
* Does the design solution meet the requirements?
* Is the set of deficiencies provided?
* Was this checklist conducted on schedule?
* Were all needed resources available and properly and fully perform this checklist at time of completion?

# Schedule:

* Has the workload been appropriately divided upon members in the development team?
* Has the work breakdown structure been established?
* Has the work breakdown structure been approved?
* Has proper deadlines been set for the coding phase?
* Were those deadlines met within reason?

# Support Material:

* Was all source code provided?
* Was all documentation provided?
* Was analysis report provided?
* Is the analysis report in the correct format?

# Structure:

* Is the user interface user friendly?
* Is the coding style consistent?
* Has professional comments been provided?
* Is there code that could be condensed?
* Is there code that could be re-written for higher optimization?
* Is there repetitive code?
* Does the code properly implement all requirements from the analysis report?
* File Opening/Closing: Will the proposed requirements cause additional files to be opened and/or closed from the previous version?
* Data Values: Will proposed changes to data values within the scope of the changes cause problems elsewhere?
* Parameter Change: Will proposed changes affect the subroutines?
* File Position change: Will proposed changes affect the files sensitive to record positioning?
* Invalid Pointer: Will proposed changes affect existing linked data structures, possible causing pointer exceptions?
* Record Layout Change: Will proposed changes affect record layouts?
* Is storage use efficient?
* Is the code consistent in style?

# Variables:

* Do all classes follow proper naming conventions?
* Do all methods follow proper naming conventions?
* Do all functions follow proper naming conventions?
* Do all variables follow proper naming conventions?
* Are there any unused variables?
* Are variables of the correct types?
* Are accessors and mutators named properly and similarly?
* Are all array references in bounds?

# Loops and Branches:

* Do loops properly initialize and increment/decrement the variables properly?
* Are loops too nested?
* Are bested loops properly nested?
* Are all cases covered in IF/ELSEIF/ELSE statements or CASE blocks?
* Does every switch statement have a default?
* Are loop termination conditions achievable?
* Does the code in the loop avoid manipulating the index variable or using it upon termination of the loop?
* Are case statements properly set up and contain breaks?
* Does the default case give an error if not reached?

# Defensive Programming:

* Do processes occur in the right order throughout the program?
* Has unit testing been done to ensure functions and methods provide the correct solutions?
* Has the functions/methods been made modular such that further expansions are easier?
* Are there any unused functions or methods?
* Do methods/functions contain appropriate error catching capabilities?
* Are the error messages direct and easy to understand?
* Does the correct form get forefront attention?
* Is the correct data being operated upon in each statement?

# Additional:

* Does the code properly send the constructed molecule structure to Python 3to generate the design?
* Does the code ensure that if the user makes their own version, that it is indeed only up to a pentadecane molecule?
* Does Python 3properly generate the map?
* Does the animation follow the process in exact accordance to the customers' models?
* After the user watches the animation and wishes to go back to the first window, does the animation window close properly?
* If the user chooses to enter in the name of the constructed molecule, does the program appropriately inform the user if they are correct or incorrect?
* If the user chooses to enter in the name of the constructed molecule and does so incorrectly, does the program appropriately inform them of their mistake and how to fix it?
* Is there code that will inform the user when additional updates or requirements have been added?
* Is there code that will allow the user to leave messages for the software engineers/developers?