



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
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3/10/04

REPLY TO THE ATTENTION OF:

WW-16J

MAR 01 2004

Dept. of Environmental Mgmt.
Commissioner's Office

Tim Method, Assistant Commissioner
Office of Water Quality
IDEM
100 North Senate Ave.
P.O. Box 6015
Indianapolis, Indiana 46206-6027

MAR 8 2004

Dear Mr. Method:

The United States Environmental Protection Agency (U.S. EPA) has conducted a complete review of the final Total Maximum Daily Load (TMDL) submittal for E. coli in Trail Creek, which is located in LaPorte County, Indiana, including supporting documentation and information. Based on this review, U.S. EPA has determined that Indiana's TMDL for one pollutant (E. coli) for this waterbody segment meets the requirements of Section 303(d) of the Clean Water Act (CWA) and U.S. EPA's implementing regulations at 40 C.F.R. Part 130. Therefore, by this letter, U.S. EPA hereby approves 1 TMDL, for Trail Creek. The statutory and regulatory requirements, and U.S. EPA's review of Indiana's compliance with each requirement, are described in the enclosed decision document.

We appreciate your hard work in this area and the submittal of the TMDL as required. If you have any questions, please contact Mr. Kevin Pierard, Chief of the Watersheds and Wetlands Branch at 312-886-4448.

Sincerely yours,

Lynn Traub,
Director, Water Division

Enclosure

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TMDL: Trail Creek, Indiana

Effective Date: 01 MAR 2004

Decision Document for Approval of the Trail Creek, Indiana E. Coli TMDL

Section 303(d) of the Clean Water Act (CWA) and EPA's implementing regulations at 40 C.F.R. Part 130 describe the statutory and regulatory requirements for approvable TMDLs. Additional information is generally necessary for EPA to determine if a submitted TMDL fulfills the legal requirements for approval under Section 303(d) and EPA regulations, and should be included in the submittal package. Use of the verb "must" below denotes information that is required to be submitted because it relates to elements of the TMDL required by the CWA and by regulation. Use of the term "should" below denotes information that is generally necessary for EPA to determine if a submitted TMDL is approvable. These TMDL review guidelines are not themselves regulations. They are an attempt to summarize and provide guidance regarding currently effective statutory and regulatory requirements relating to TMDLs. Any differences between these guidelines and EPA's TMDL regulations should be resolved in favor of the regulations themselves.

1. Identification of Waterbody, Pollutant of Concern, Pollutant Sources, and Priority Ranking

The TMDL submittal should identify the waterbody as it appears on the State's/Tribe's 303(d) list. The waterbody should be identified/georeferenced using the National Hydrography Dataset (NHD), and the TMDL should clearly identify the pollutant for which the TMDL is being established. In addition, the TMDL should identify the priority ranking of the waterbody and specify the link between the pollutant of concern and the water quality standard (see section 2 below).

The TMDL submittal should include an identification of the point and non-point sources of the pollutant of concern, including location of the source(s) and the quantity of the loading, e.g., lbs/per day. The TMDL should provide the identification numbers of the National Pollutant Discharge Elimination System (NPDES) permits within the waterbody. Where it is possible to separate natural background from non-point sources, the TMDL should include a description of the natural background. This information is necessary for EPA's review of the load and wasteload allocations, which are required by regulation.

The TMDL submittal should also contain a description of any important assumptions made in developing the TMDL, such as:

- (1) the spatial extent of the watershed in which the impaired waterbody is located;
- (2) the assumed distribution of land use in the watershed (e.g., urban, forested, agriculture);
- (3) population characteristics, wildlife resources, and other relevant information affecting

the characterization of the pollutant of concern and its allocation to sources;
(4) present and future growth trends, if taken into consideration in preparing the TMDL (e.g., the TMDL could include the design capacity of a wastewater treatment facility); and
(5) an explanation and analytical basis for expressing the TMDL through *surrogate measures*, if applicable. *Surrogate measures* are parameters such as percent fines and turbidity for sediment impairments; chlorophyll *a* and phosphorus loadings for excess algae; length of riparian buffer; or number of acres of best management practices.

Comment:

The Trail Creek Escherichia Coli TMDL Report (TMDL submittal) covers the Trail Creek watershed in LaPorte County, Indiana, an area of approximately 38,000 acres. This waterbody segment, waterbody identification number IN 137, was listed on the Indiana Department of Environmental Management (IDEM) 1998 and 2002 303(d) lists as impaired, with the cause of impairment identified as E. coli. The TMDL submittal includes 1 TMDL that was developed for E. coli for 1 impaired segment. The TMDL was prioritized for development in 2004, and was submitted on January 15, 2004.

The Trail Creek watershed is impacted by both point and non-point sources. Sources include four permitted point source dischargers, failing septic systems, illicit connections to storm drains, agricultural run-off, and non-regulated storm water run-off. The TMDL includes an overall load reduction for the sources contributing to the impairment, and describes the land use patterns and source categorizations.

EPA finds that this TMDL submittal satisfies all requirements of this first element.

2. Description of the Applicable Water Quality Standards and Numeric Water Quality Target

The TMDL submittal must include a description of the applicable State/Tribal water quality standard, including the designated use(s) of the waterbody, the applicable numeric or narrative water quality criterion, and the antidegradation policy. (40 C.F.R. §130.7(c)(1)). EPA needs this information to review the loading capacity determination, and load and wasteload allocations, which are required by regulation.

The TMDL submittal must identify a numeric water quality target(s) – a quantitative value used to measure whether or not the applicable water quality standard is attained. Generally, the pollutant of concern and the numeric water quality target are, respectively, the chemical causing the impairment and the numeric criteria for that chemical (e.g., chromium) contained in the water quality standard. The TMDL expresses the relationship between any necessary reduction of the pollutant of concern and the attainment of the numeric water quality target. Occasionally, the pollutant of concern is different from the pollutant that is the subject of the numeric water quality target (e.g., when the pollutant of concern is phosphorus and the numeric water quality target is expressed as Dissolved Oxygen (DO) criteria). In such cases, the TMDL submittal should explain the linkage between the pollutant of concern and the chosen numeric water quality target.

Comment:

Trail Creek has been determined by IDEM to be impaired for recreational use by *E. coli*. The applicable IDEM water quality standard (WQS) is found at 327 IAC 2-1-6 (d) which requires that "E. coli bacteria, using membrane filter (MF) count, shall not exceed one hundred twenty-five (125) per one hundred (100) milliliters as a geometric mean based on not less than five (5) samples equally spaced over a thirty (30) day period nor exceed two hundred thirty-five (235) per one hundred (100) milliliters in any one (1) sample in a thirty day period." This is the water quality standard for which the TMDL was developed.

The WQS applies to those waters with the designated use of full-body contact recreation, which is in effect from April through October. Trail Creek's designated use is for full-body contact recreation.

EPA finds that this TMDL submittal satisfies all requirements of this second element.

3. Loading Capacity - Linking Water Quality and Pollutant Sources

A TMDL must identify the loading capacity of a waterbody for the applicable pollutant. EPA regulations define loading capacity as the greatest amount of a pollutant that a water can receive without violating water quality standards (40 C.F.R. §130.2(f)).

The pollutant loadings may be expressed as either mass-per-time, toxicity or other appropriate measure (40 C.F.R. §130.2(i)). If the TMDL is expressed in terms other than a daily load, e.g., an annual load, the submittal should explain why it is appropriate to express the TMDL in the unit of measurement chosen. The TMDL submittal should describe the method used to establish the cause-and-effect relationship between the numeric target and the identified pollutant sources. In many instances, this method will be a water quality model.

The TMDL submittal should contain documentation supporting the TMDL analysis, including the basis for any assumptions; a discussion of strengths and weaknesses in the analytical process; and results from any water quality modeling. EPA needs this information to review the loading capacity determination, and load and wasteload allocations, which are required by regulation.

TMDLs must take into account *critical conditions* for stream flow, loading, and water quality parameters as part of the analysis of loading capacity. (40 C.F.R. §130.7(c)(1)). TMDLs should define applicable *critical conditions* and describe their approach to estimating both point and non-point source loadings under such *critical conditions*. In particular, the TMDL should discuss the approach used to compute and allocate non-point source loadings, e.g., meteorological conditions and land use distribution.

Comment:

The WQS for *E. coli* is expressed as a concentration. The modeling IDEM performed for the

submittal evaluated what daily loads (expressed as organism counts) resulted in concentrations (cfu/100ml) that met the WQS. The final TMDL represents the total number of colony forming units of *E. coli* that can exist in Trail Creek and still meet the WQS.

For analysis purposes, IDEM divided the Trail Creek watershed into 3 sub-watersheds, the Main, East, and West Branches. Several small tributaries in the subwatersheds were not modeled individually. Trail Creek discharges into Lake Michigan, and is subject to frequent flow reversals at the mouth due to natural seiche action of Lake Michigan (Pg. 4 of the TMDL submittal). This effect may extend up to two miles upstream, complicating the modeling efforts.

IDEM reviewed numerous data sources, including that from the Michigan City Sanitary District, the LaPorte County Health Department, and IDEM files. The review indicated that the loads of *E. coli* are increasing in the watershed, and are from both dry weather (illicit or failing septics, cattle in the streams) and wet weather sources (urban storm water, agricultural run-off).

IDEM selected the General Water Loading Function (GWLF) model to analyze the watershed and the Water Quality Analysis Simulation Program (WASP6) model to analyze the impacts of the loads on water quality. The GWLF model was used to calculate run-off amounts from various use types, based on rainfall inputs and soil types. Data from 1998-2001 was used in the model, and the model was calibrated using 2000 data, as it had the largest number of samples. More details and information on the inputs for the GWLF model are found in Chapter 5 of the TMDL.

The WASP6 model was used to simulate water quality in the major branches due to the loadings, flows in the waterbodies, and chemical/physical reactions. The flows and loads generated from the GWLF model were inputted into the WASP6 model, to determine what the impacts would be on water quality. Point source loads were included in the model. The assumptions and data inputs for the models are further explained in Sect. 5.2.2 of the TMDL. Table 5-8 of the TMDL shows the monthly loads of *E. coli* for the three subwatersheds, groundwater base flow, and a total for the watershed.

The model was then run based upon reductions until the loads in the creek met the water quality standard. Based upon the modeling and the water quality standard, the loading capacity for Trail Creek is found in Table 6-3 of the TMDL submittal (Table 1 below). The Total Maximum Daily Load for *E. coli* is expressed as an organism count, as approved in the U.S. EPA's 2001 *Protocol for Developing Pathogen TMDLs*, EPA 841-R-00-0002 at 7.1. This represents a load reduction ranging from 40-99%, depending on the month. The loading capacity is calculated for the months of April -October, as that is when the WQS applies.

In the TMDL submittal, IDEM states that there is no one critical condition for the TMDL. The model includes the conditions contributing the greatest load (wet weather), as well as the specific sources contributing load under wet weather (storm water) and dry conditions (background and failing septics). EPA believes the TMDL submittal addresses the critical flow and loading conditions for this impairment.

EPA finds that this TMDL submittal satisfies all requirements of this third element.

4. Load Allocations (LAs)

EPA regulations require that a TMDL include LAs, which identify the portion of the loading capacity attributed to existing and future non-point sources and to natural background. Load allocations may range from reasonably accurate estimates to gross allotments (40 C.F.R. §130.2(g)). Where possible, load allocations should be described separately for natural background and non-point sources.

Comments:

The TMDL submittal in Table 6-2 identifies the LA for the three subwatersheds, baseflow (groundwater), and the total LA (Table 2 below). The LA is calculated for the months of April-October, when the WQS applies.

EPA finds that this TMDL submittal satisfies all requirements of this fourth element

5. Wasteload Allocations (WLAs)

EPA regulations require that a TMDL include WLAs, which identify the portion of the loading capacity allocated to individual existing and future point source(s) (40 C.F.R. §130.2(h), 40 C.F.R. §130.2(i)). In some cases, WLAs may cover more than one discharger, e.g., if the source is contained within a general permit.

The individual WLAs may take the form of uniform percentage reductions or individual mass based limitations for dischargers where it can be shown that this solution meets WQSS and does not result in localized impairments. These individual WLAs may be adjusted during the NPDES permitting process. If the WLAs are adjusted, the individual effluent limits for each permit issued to a discharger on the impaired water must be consistent with the assumptions and requirements of the adjusted WLAs in the TMDL. If the WLAs are not adjusted, effluent limits contained in the permit must be consistent with the individual WLAs specified in the TMDL. If a draft permit provides for a higher load for a discharger than the corresponding individual WLA in the TMDL, the State/Tribe must demonstrate that the total WLA in the TMDL will be achieved through reductions in the remaining individual WLAs and that localized impairments will not result. All permittees should be notified of any deviations from the initial individual WLAs contained in the TMDL. EPA does not require the establishment of a new TMDL to reflect these revised allocations as long as the total WLA, as expressed in the TMDL, remains the same or decreases, and there is no reallocation between the total WLA and the total LA.

Comments:

Table 6-1 of the TMDL submittal lists the WLA for the four NPDES point sources (Table 3 below). The allocations do not represent any reduction in permitted loads for the facilities; currently, the facilities are either disinfecting (resulting in a load well below the WLA), or discharge outside the recreational season. All four facilities are currently operating under NPDES.

permits which limit their discharge to the WQS. No storm water permits have been issued in the watershed. Currently, Michigan City is implementing their Long Term Control Plan to eliminate combined sewer overflow (CSO) discharges in the watershed, a process that has already seen reductions in such discharges, with only one CSO discharge occurring in the years 1999 - 2001. Because of these efforts and additional proposed efforts, the CSO is not considered a source, and has not been assigned a WLA.

EPA finds that this TMDL submittal satisfies all requirements of this fifth element

6. Margin of Safety (MOS)

The statute and regulations require that a TMDL include a margin of safety (MOS) to account for any lack of knowledge concerning the relationship between load and wasteload allocations and water quality (CWA §303(d)(1)(C), 40 C.F.R. §130.7(c)(1)). EPA's 1991 TMDL Guidance explains that the MOS may be implicit, i.e., incorporated into the TMDL through conservative assumptions in the analysis, or explicit, i.e., expressed in the TMDL as loadings set aside for the MOS. If the MOS is implicit, the conservative assumptions in the analysis that account for the MOS must be described. If the MOS is explicit, the loading set aside for the MOS must be identified.

Comments:

Margins of safety can be either implicit (i.e., incorporated into the TMDL analysis through conservative assumptions), or explicit (i.e., expressed in the TMDL as a portion of the loadings). The Trail Creek TMDL for E. coli contains an implicit margin of safety because no rate of decay was used in the model calculating allocations. Since pathogenic organisms have a more limited capability of surviving outside their hosts, a rate of decay would normally be used. However, it was determined by IDEM that it is more conservative to use the water quality standard of 125 E. coli per 100 ml, and not to apply a rate of decay which could result in a discharge limit greater than the water quality standard.

EPA finds that this TMDL submittal satisfies all requirements of this sixth element.

7. Seasonal Variation

The statute and regulations require that a TMDL be established with consideration of seasonal variations. The TMDL must describe the method chosen for including seasonal variations. (CWA §303(d)(1)(C), 40 C.F.R. §130.7(c)(1)).

Comments:

The TMDL addresses the seasonal variation by setting load allocations for the months of April through October to protect for total body contact as set out in 327 IAC 2-1-6 (d). Seasonality is also accounted for in the TMDL by determining how the loads would be impacted during different times of the year, and using meteorological data over a 2 year time period thus capturing seasonal changes in flows and runoff.

EPA finds that this TMDL submittal satisfies all requirements of this seventh element.

8. Reasonable Assurances

When a TMDL is developed for waters impaired by point sources only, the issuance of a National Pollutant Discharge Elimination System (NPDES) permit(s) provides the reasonable assurance that the wasteload allocations contained in the TMDL will be achieved. This is because 40 C.F.R. 122.44(d)(1)(vii)(B) requires that effluent limits in permits be consistent with "the assumptions and requirements of any available wasteload allocation" in an approved TMDL.

When a TMDL is developed for waters impaired by both point and non-point sources, and the WLA is based on an assumption that non-point source load reductions will occur, EPA's 1991 TMDL Guidance states that the TMDL should provide reasonable assurances that non-point source control measures will achieve expected load reductions in order for the TMDL to be approvable. This information is necessary for EPA to determine that the TMDL, including the load and wasteload allocations, has been established at a level necessary to implement water quality standards.

EPA's August 1997 TMDL Guidance also directs Regions to work with States to achieve TMDL load allocations in waters impaired only by non-point sources. However, EPA cannot disapprove a TMDL for non-point source-only impaired waters, which do not have a demonstration of reasonable assurance that LAs will be achieved, because such a showing is not required by current regulations.

Comments:

Reasonable assurance for the point sources is provided by the IDEM NPDES program. For the non-point source reductions, IDEM will be using existing regulations and land use requirements to address the non-NPDES storm water impacting Trail Creek. The Michigan City Sanitary District has received a Clean Water Act Section 319 grant through the Indiana Department of Environmental Management for use in updating the Trail Creek Watershed plan. One of the major objectives of the proposed plan is to develop specific goals, strategies, and actions that will reduce E. coli loads in Trail Creek.

EPA finds that this TMDL submittal satisfies all requirements of this eighth element.

9. Monitoring Plan to Track TMDL Effectiveness

EPA's 1991 document, *Guidance for Water Quality-Based Decisions: The TMDL Process* (EPA 440/4-91-001), recommends a monitoring plan to track the effectiveness of a TMDL, particularly when a TMDL involves both point and non-point sources, and the WLA is based on an assumption that non-point source load reductions will occur. Such a TMDL should provide assurances that non-point source controls will achieve expected load reductions and, such TMDL should include a monitoring plan that describes the additional data to be collected to determine if the load reductions provided for in the TMDL are occurring and leading to attainment of water

quality standards.

Comments:

The Michigan Sanitary District currently performs sampling in the Trail Creek watershed. This sampling is part of their NPDES permit, and will continue in the future. IDEM will conduct additional monitoring as part of their Basin Rotation Monitoring program in 2005.

EPA finds that this TMDL submittal satisfies all requirements of this ninth element.

10. Implementation

EPA policy encourages Regions to work in partnership with States/Tribes to achieve non-point source load allocations established for 303(d)-listed waters impaired by non-point sources. Regions may assist States/Tribes in developing implementation plans that include reasonable assurances that non-point source LAs established in TMDLs for waters impaired solely or primarily by non-point sources will in fact be achieved. In addition, EPA policy recognizes that other relevant watershed management processes may be used in the TMDL process. EPA is not required to and does not approve TMDL implementation plans.

Comment:

This TMDL submittal does not contain a formal implementation plan, since it is not required under the current EPA regulations. The majority of the load into the Trail Creek watershed is from non-point sources, and efforts are underway to address the loads from these sources. Further implementation activities are discussed in Section 8 above.

While the implementation information was reviewed, it did not affect the decision to approve the TMDL.

11. Public Participation

EPA policy is that there should be full and meaningful public participation in the TMDL development process. The TMDL regulations require that each State/Tribe must subject calculations to establish TMDLs to public review consistent with its own continuing planning process (40 C.F.R. §130.7(c)(1)(ii)). In guidance, EPA has explained that final TMDLs submitted to EPA for review and approval should describe the State's/Tribe's public participation process, including a summary of significant comments and the State's/Tribe's responses to those comments. When EPA establishes a TMDL, EPA regulations require EPA to publish a notice seeking public comment (40 C.F.R. §130.7(d)(2)).

Provision of inadequate public participation may be a basis for disapproving a TMDL. If EPA determines that a State/Tribe has not provided adequate public participation, EPA may defer its approval action until adequate public participation has been provided for, either by the State/Tribe or by EPA.

Comments:

Public participation in this TMDL began with a public meeting on July 25, 2002 held by IDEM. IDEM held additional meetings on October 23, 2002, and March 19, 2003 and held the final public meeting on September 15, 2003. The public comment period for this TMDL was from September 15 to October 15, 2003. Notice of this public comment period was published in the IDEM State Calendar, and copies of the TMDL were available on the IDEM website. Neighborhood organizations and environmental groups in the area were invited to the meetings. No comments were received on the TMDL during the public comment period.

EPA finds that this TMDL submittal satisfies all requirements of this eleventh element.

12. Submittal Letter

A submittal letter should be included with the TMDL submittal, and should specify whether the TMDL is being submitted for a *technical review* or *final review and approval*. Each final TMDL submitted to EPA should be accompanied by a submittal letter that explicitly states that the submittal is a final TMDL submitted under Section 303(d) of the Clean Water Act for EPA review and approval. This clearly establishes the State's/Tribe's intent to submit, and EPA's duty to review, the TMDL under the statute. The submittal letter, whether for technical review or final review and approval, should contain such identifying information as the name and location of the waterbody, and the pollutant(s) of concern.

Comment:

The transmittal letter was dated January 13, 2003, from Mary Ellen Gray, Deputy Assistant Commissioner, IDEM, to Kevin Pierard, chief of the Watersheds and Wetlands Branch, Region 5 EPA. The letter stated clearly that this was a final TMDL submittal under Section 303(d) of the CWA. The letter also contains the name of the watershed as it appears on the Indiana 303(d) list, and the causes/pollutants of concern. This decision document addresses the approval of one TMDL as submitted by IDEM.

EPA finds that this TMDL submittal satisfies all requirements of this twelfth element

13. Conclusion

After a full and complete review, EPA finds that the TMDL for Trail Creek (IN 137) satisfies all of the elements of an approvable TMDL. This approval is for one waterbody segment impaired by E. coli for a total of one TMDL addressing one impairment.

Table 1
Trail Creek TMDL *E. coli* WLA & LA (cfu/day)

Month	Total WLA	Total LA	TMDL
April	5.72×10^{10}	1.75×10^{11}	2.32×10^{11}
May	5.72×10^{10}	1.04×10^{11}	1.61×10^{11}
June	5.72×10^{10}	4.91×10^{11}	5.48×10^{11}
July	5.72×10^{10}	1.29×10^{11}	1.86×10^{11}
August	5.72×10^{10}	9.18×10^{10}	1.49×10^{11}
September	5.72×10^{10}	1.09×10^{11}	1.66×10^{11}
October	5.72×10^{10}	1.09×10^{11}	1.66×10^{11}

Table 2
Nonpoint Source *E. coli* LA (cfu/day)

Month	East Branch	West Branch	Main Branch	Baseflow	Total
April	1.36×10^{10}	1.42×10^{10}	5.50×10^{10}	9.18×10^{10}	1.75×10^{11}
May	3.38×10^8	3.98×10^8	1.17×10^{10}	9.18×10^{10}	1.04×10^{11}
June	1.18×10^{11}	1.30×10^{11}	1.51×10^{11}	9.18×10^{10}	4.91×10^{11}
July	1.08×10^{10}	1.16×10^{10}	1.45×10^{10}	9.18×10^{10}	1.29×10^{11}
August	1.69×10^5	1.82×10^5	1.68×10^7	9.18×10^{10}	9.18×10^{11}
September	2.49×10^9	4.57×10^9	1.04×10^{10}	9.18×10^{10}	1.09×10^{11}
October	4.53×10^3	9.73×10^3	1.68×10^{10}	9.18×10^{10}	1.09×10^{11}

Table 3
 Point Source *E. coli* WLA (cfu/day)

Month	Michigan City Sanitary Station	Friendly Acres MHP	Autumn Creek MHP	Indian Springs Subdivision
April	5.68×10^{10}	6.81×10^8	1.18×10^8	1.18×10^8
May	5.68×10^{10}	6.81×10^8	1.18×10^8	1.18×10^8
June	5.68×10^{10}	6.81×10^8	1.18×10^8	1.18×10^8
July	5.68×10^{10}	6.81×10^8	1.18×10^8	1.18×10^8
August	5.68×10^{10}	6.81×10^8	1.18×10^8	1.18×10^8
September	5.68×10^{10}	6.81×10^8	1.18×10^8	1.18×10^8
October	5.68×10^{10}	6.81×10^8	1.18×10^8	1.18×10^8

TMDL Information for National TMDL Tracking System (NTTS)

Waterbody Name	Trail Creek
Waterbody ID	#137, HUC 04040001070030
State	Indiana
Pollutant	E. coli
Impairment	pathogen
TMDL Type (PS, NPS, both?)	Both
WLA	5.72×10^{10} cfu/day
Permit ID # (please indicate if NPDES or other)	NPDES permits: IN0023752, IN0040975, IN0050041, IN0060585
LA	See below
Federal TMDL?	No
TMDL Approval Date	

Month	Total LA
April	1.75×10^{11}
May	1.04×10^{11}
June	4.91×10^{11}
July	1.29×10^{11}
August	9.18×10^{10}
September	1.09×10^{11}
October	1.09×10^{11}