TH 694
(SP 6285-135)

Temporary Erosion Control Alternative Contracting Report

March 2014

Your Destination...Our Priority

Purpose:

The project on the I-694/Snelling/TH 10/ Interchanges used an alternative contracting method for temporary erosion control. Typically, MnDOT designs an erosion control plan with quantified items for the Contractor to bid. This project employed a lump sum item for temporary erosion control practices in order to mitigate risk for MnDOT, reduce project administration costs, and allow for Contractor flexibility and innovation.

The I-694 Project consisted of major reconstruction of the interchange at Snelling Avenue (TH 51) and Hamline Avenue in Arden Hills, reconstruction of the I-35W/TH 10 interchange, and the construction of the Ramsey County Highway 96 interchange with TH 10. The Project began in September 2011 with substantial completion in the Fall of 2013. The complexity of the staging and the sensitive environmental resources made the project a complex yet valuable opportunity to improve contracting methods.

To evaluate this method, in the spring of 2013 a survey gathered the perspectives of key stakeholders. This process consisted of circulating a questionnaire and conducting one on one interviews with individuals involved with the project. These individuals represented the viewpoints of MnDOT (Design, Construction, and Water Resources), Regulatory Agency, Contractors, and Monitoring Oversight groups. The Regulatory Agency consisted of Rice Creek Watershed District, MPCA, and Ramsey County Conservation District.

The spring 2013 survey revealed varying degrees of satisfaction with the Lump Sum Temporary Erosion Control contracting method. The survey utilized both rating scales and short answer questions to gain perspectives on the method in general, how the bidding was executed, and how the specifications affected the work. In order to gain a more complete picture of the Temporary Erosion Control work on the project, stakeholders completed a second round of interviews in the spring of 2014 after the second construction season on the Project. The second phase of interviewing was intended to determine if an additional year of work had provided more insight into the methods or changed anyone's perspective.

This final report presents the results of two years of surveys and interviews with Project stakeholders as well as recommendations for consideration on future projects utilizing Lump Sum Erosion Control.

Timeline:

MnDOT selected individuals from the key parties to participate in one-on-one interviews which occurred between March and May 2013. The individuals received the surveys and Parsons Brinckerhoff met with respondents to clarify responses and record additional feedback. Participants included 4 Contractors, 3 Regulatory Agency members, 7 MnDOT employees, and 1 Monitoring Oversight member.

The second phase of interviews occurred in February 2014. The individuals received the questionnaires and Parsons Brinckerhoff met with respondents to gain clearer insight into their responses. Participants included 2 Engineers, 1 Inspector, 1 Advisory Member, and 2 Contractors. The survey and this report will keep the names of the participants confidential to ensure candid responses.

While the first survey included fifteen participants, many of those respondents didn't respond to requests for involvement, were no longer in their previous positions, or hadn't been involved in the second year of construction making only six available participants for the second phase of survey. For this reason it was determined that the second round would consist primarily of one-on-one interviews to gain the most clear and comprehensive perspective on the value of using Lump Sum for Temporary Erosion Control. Included in the interviews were project engineers, inspectors, advisory members, and contractors from the original survey group. This report presents the results of the feedback given in the one-on-one interviews. This report also provides recommended actions to help improve the system based on feedback received from the interviews.

General Summary:

Every interview participant was very interested in having an opportunity to provide input from their experience on the Project. Contractors, oversight members, and advisory members all felt that it was important that every perspective be considered to create the most fair and profitable method for managing temporary erosion control. Some suggested minor tweaks to make it more manageable, others proposed more dramatic changes.

Overall there is a pretty stark divide between the contractors and the owners/regulators. Based on Survey and Interview results, it appears the Contractors were not satisfied with the Erosion Control Alternative Contracting Method. MnDOT, the Regulatory Agency, and the Monitoring Oversight team were satisfied with the Alternative Contracting Method. The questionnaires identified three major themes as areas of disconnect between the satisfaction of MnDOT and the dissatisfaction of the Contractor.

All groups stressed the importance to have a contract that both manages risk for each party and balances risk between the parties. The bidding process is difficult to navigate for subcontractors as they are not given the details of any staging concepts from prime contractors, but they assumed all the risk in their bid. Participants discussed the need to coordinate responsibilities between the parties and to determine who performs which tasks.

Multiple interviewees indicated that the Best Management Practices (BMPs) need to be better defined for temporary erosion control. A lack of a temporary erosion control manual was a large area of concern for all groups; as was the need to submit an approved Storm Water Pollution Prevention Plan (SWPPP) required by the NPDES Construction Stormwater Permit (by using the SWPPP provided by MnDOT in the Reference Information Documents [RID] or modifying it for

proposed staging).

Generally, while MnDOT inspectors spent much less time measuring in the field, other participants not normally working in the field spent more time on site and less time in the office due to a larger focus on site walk-throughs and field meetings. Respondents suggested improvements to the requirements and specifications to give all parties a better understanding of the requirements for the project.

One of the primary reasons for pursuing Lump Sum Erosion Control was to mitigate risk for MnDOT. However, many respondents commented on the high amount of risk shifted to the contractor. It is acknowledged that shifting risk to the contractor is accompanied by higher costs, yet one must consider if the trade-offs are acceptable. Does shifting the risk to the contractor create any unintended consequences such as higher than expected costs, insufficient means to mitigate other risks, or poorer contractor communication? Some of these possibilities may have revealed themselves in some of the survey answers. Further engagement will provide more opportunities to answer these questions and improve the process for all project stakeholders.

As a result of some of the more major themes from the project revealed in this study, MnDOT has already begun the process of implementing improvements to the Lump Sum methods and specifications. The completed study will provide greater clarity in refining the contracting method for future projects.

Themes:

The surveys and questionnaires asked, sought to gain input from the various participants through questions divided into three general talking points:

1. General Questions.

   The base of these questions focused on project improvements including, but not limited to, the amount and type of erosion control work done for the project, the ease of staying in compliance, and of the inspection and corrective action practices. It compared and rated time management of the project and risk management successfulness.

2. Bidding Process/Cost Implications.

   Discussions in this phase of the interview session centered upon the contract processes along with cost consequences and incentives. The questions asked for input on making the bidding process more equitable, suggestions for improving systems, and insight on project expenses. The surveys also asked questions relating to managing expenses for lump sum items.

3. Specifications and Monitoring.

   Questions presented in this section related to Best Management Practices. Inquiries

were directed at the need for or limit of regulations in various portions of the project. It also examined certain regulations and their adequacy.

Findings:

There were three main topics discussed by the different groups.

1. General

    a. Risk management was important to all stakeholders. Since erosion control is greatly affected by weather conditions, parties need to take unknown weather conditions into account during the bidding process in order to ensure sufficient funds for the project. The variability of weather makes it difficult for contractors to determine an accurate bid.

    b. Participants from all backgrounds indicated the need to balance risk between MnDOT and Contractor. On this specific project, MnDOT paid for flocculants needed after a large storm event to limit sediment transfer. Holding the Contractor responsible for small storm events and MnDOT responsible for large unforeseeable events allowed the groups to balance the risk and responsibility between the parties. Some respondents suggested that MnDOT add a threshold for a higher intensity, shorter duration rain event to help balance risk.

    c. While working on this project, Contractor and Subcontractor had to determine who would carry out certain aspects of the erosion control process and for what price. The Contractor indicated a large responsibility placed on the subcontractor for Erosion Control. Because of this, the risk placed on the subcontractor was higher. This required a large amount of trust between the prime and the subcontractors.

    d. Much less time was spent on administration of temporary erosion control with no need to measure and debate over quantities.

    e. By the second year, communication between oversight groups and contractors had worked well in weekly meetings to discuss erosion control issues.

    f. While one perspective desired for Lump Sum to be removed from contracting options, multiple suggestions were given to improve the system, including: improved monitoring methods (need for better accuracy, web-based reporting), more pay incentives, permitting clarifications, and clearer specifications.

    g. Coordination between the prime contractor and the subcontractor was more difficult. Without an agreed upon staging and erosion control plan from the prime contractor, the sub had nothing to schedule around and refer to in planning. Similarly, the

bidding process was more difficult for the subcontractor as the prime doesn't want to share its staging plan prior to contract award. Subcontractor assumes more risk in estimating this type of project if providing a lump sum estimate. During the project the prime passes more risk onto the subcontractor while maintaining incentives.

2. Bidding Process/Cost Implications.

    a. Some MnDOT participants felt that the BMPs need to be better defined. They suggested having BMPs for typical situations clearly defined in a single manual. MnDOT indicated that in some cases the Contractor followed the minimum requirements until the BMP failed, and in many cases the minimum requirements were not enough to protect downstream water resources. It was also noted that the volumes of runoff for this project overwhelmed the BMPs in place.

    b. MnDOT and the Contractor suggested having a temporary erosion control manual to describe possible methods to use for erosion control in temporary conditions. MnDOT and the Contractor also indicated a need for more temporary erosion control requirements. The Regulatory party suggested temporary sediment basins on the project to prevent turbid discharges, identifying this as the biggest issue with the temporary erosion control lump sum specifications.

    c. The approval of the construction contract is contingent on the SWPPP; to ensure the SWPPP does not unnecessarily delay the approval of the contract MnDOT suggested there be a time frame for SWPPP submission. MnDOT also suggested including more information on the permit process to provide more guidance to the contractors in designing a temporary erosion control plan. It was also stated that the Contractor and SWPPP designer need to be informed that there is an MOU in place between MnDOT and the MPCA. According to the Regulatory Agency, the Contractor understood the SWPPP better in the field walk-throughs due to being a part of the SWPPP development.

    d. Respondents felt that providing a pre-bid meeting would increase fairness of the bid process in the future.

    e. Wind erosion was an issue and all parties felt like there was not clear guidance or specifications on how to address it. Watering for wind-erosion is not a bid item and it is not clear if it should be a permanent or temporary erosion control item.

3. Specifications and Monitoring.

    a. The site monitoring for this project differed from the typical project. In general, participants from all backgrounds felt that, while there was less measuring and

direct inspection to do, there was a large portion of time dedicated to site walk-throughs and field meetings. MnDOT indicated that the Contractor has been both proactive and responsive in correcting any issues noted by MnDOT.

b. Turbidity monitoring was a source of concern. Turbidity monitoring is an important measure of the discharge water quality, but the Regulatory party felt that turbidity monitoring became a secondary measure. Participants indicated that the turbidity levels increased significantly after rain events, and were far out of compliance with the BMPs in place. Only after temporary sediment basins and ponds were installed, the turbidity levels and erosion control and sediment transfer were managed. MnDOT suggested improving turbidity monitoring to make payouts fairer year round.

c. Contractor responsibility for turbidity monitoring consisted only of installing and maintaining monitors to collect and provide data to MnDOT. It was unclear to Contractors what the accuracy and usefulness of the monitoring data was. The Monitoring Oversight group indicated that the weekly emails of monitoring results gave an ongoing opportunity for stakeholder involvement and feedback.

d. Most agreed that the rainfall threshold wasn't ideal, saying that the line may be too rigid or not reflective of how storms occurred. Multiple times the threshold was approached in back-to-back storms causing localized flooding, but not crossing the threshold. Additionally, determining the type of storm in the field is a difficult task. The threshold of 3.0 inches of rainfall in a 24-hour period is difficult to apply to varying site conditions or multiple day storms. While some thought it was the only way to draw a clear line to avoid debates, others offered alternative suggestions for tracking rainfall events: sliding thresholds, intensity thresholds, and ground saturation thresholds.

e. Some suggested improvements to the requirements and specifications. Most respondents expressed that the specifications need to be more detailed. MnDOT and the Regulatory Agencies felt that requiring sediment ponds at the beginning of the project with strong enforcement would have aided in controlling sediment transfer. Adding staging requirements, however, defeats the purpose of Lump Sum/Performance-Based contracting.

f. Contractor was pleased that his expertise in the knowledge of emerging erosion control methods was trusted in Lump Sum contracting. However, there wasn't a clearly defined path for introducing new practices or a list of existing practices he was confident would be accepted.

Recommendations:

After two seasons of construction, a considerable amount of input was gathered to help improve the Lump Sum Erosion Control Contracting method for both the owner and the contractors. Based on this input, this report suggests the following recommendations for the Lump Sum Erosion Control Alternative Contracting Method:

Erosion Control Manual

A common theme among many of the discussions was a lack of clarity for roles, responsibilities, authority, expectations, and acceptable methods and materials. The first recommendation, which may encapsulate some of the following recommendations, is to complete an Erosion Control Manual which outlines standard contracting procedures and construction methods to provide a single reference point for project stakeholders to reference. The Erosion Control Manual should at a minimum address acceptable methods and materials as well as describe various types of contracting methodologies which may impact risk, bidding, responsibility and authority on projects. It would also outline a process for accepting proposed methods not included in the Manual; such as allowing the Contractor to implement the proposed BMP while submitting samples for review.

Refine Incentives

While there were incentives written into the specification, confusion over their availability and attainment remained among the Contractors. Throughout the process of improving the Lump Sum Contracting method, continue to refine the incentives, particularly modifying the definitions for the attainment criteria.

Clarify Authority and Responsibility

As previously stated, the interviews revealed a lack of understanding to the responsibility and authority for the various roles required in the Lump Sum Erosion Control contracting method. This may simply be a result of a change in common procedure and will require time for contractors to adjust, but more effort should be given to clarify expectations where they may have changed from a standard contracting project. This clarity may be added in multiple ways, such as: the previously mentioned Erosion Control Manual, a pre-construction meeting, or clarifications in the specifications/bidding documents.

Pre-Letting Project Kickoff Meeting

Another alternative for communicating the specialized requirements of the Lump Sum Erosion Control method is to hold a Pre-Letting Project Kickoff Meeting. This gathering would invite all potential bidders (prime and subcontractors) in order to give them as much information as possible. It would allow them the opportunity to hear about unique site features as well as distinct specifications that should be considered in the Lump Sum bid item. The meeting should stress the importance of communication and clarification of risks and responsibilities between contractors, their subcontractors, and the key project stakeholders.

Require Pond Sequencing in SWPPP

The lack of pond staging in the SWPPP made it challenging to determine how temporary erosion control would tie into permanent erosion control. While some felt it would be beneficial to require temporary ponds, it would fit the intention of the contracting method better to simply require the Contractor to provide within the SWPPP his proposed permanent pond sequencing.

Refine Rainfall Threshold

While the rainfall threshold intended to provide a line by which to judge the amount of precipitation on the project for purposes of reimbursement for additional erosion control, it did not adequately provide a quality standard by which to consistently judge the need for supplementary measures. As stated earlier, the intensity and duration of the storm as well as the type of soils on the project created conditions which required more work than anticipated yet never matched the type of storm used as the threshold.

It is recommended that further consideration be given to refining the threshold to better apply the standards to variable project conditions. Possible alternatives might be a short-, medium-, and long-duration thresholds to apply to varying storm durations or even some kind of saturation threshold to better anticipate surface runoff for varying soil conditions. A longer storm duration (e.g. 72 hours) would cover both saturation and extended storm event concerns. While there are challenges with each method, a general threshold that can be applied to variable site conditions allows for more equity in the evaluation of methods employed.

Similarly, as new ATLAS-14 standards have been released, modify the specifications to reflect the most current models and make contractors aware of the updated standards.

Further Considerations

Beyond the previous items recommended to be pursued, there are some questions to consider while moving forward in the further development of Alternative Contracting measures. These aren't specific items to be implemented, but concepts to consider in every step of development.

Monitoring turbidity was a source of a large amount of disagreement in the interviews. It was unclear who was responsible for what portions of the data, and what was to be done with the results. The data resulting from the monitoring was questioned as well as the fairness of payment tied to the monitoring results. Continued refinement of the monitoring process will give greater confidence in the results, provide more value to the project environment through more refined application of erosion control measures, as well as create more equity in the payment process.

While it is not MnDOT's responsibility to manage contractor relations, consideration should be given to means and methods that can encourage and facilitate healthier contractor communication. The results of these efforts may not be directly quantifiable, but may have positive effects shown in more organized project coordination, greater efficiency in field work, and higher confidence in bid results.

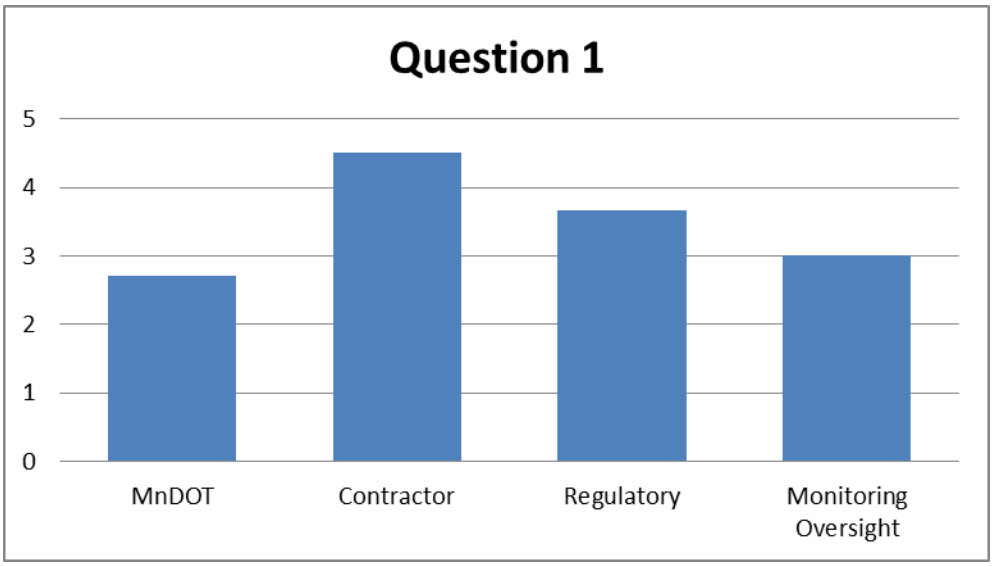
Finally, the results of this report should be shared with multiple industry stakeholders and further engagement is strongly encouraged. The interviews revealed skepticism that these findings would not be taken into serious consideration prior to implementing further change. To continue to refine this contracting method, it will be necessary to regularly engage the industry through more studies like this one as well as provide public opportunity for further comment and suggestion. A follow-up conference to this report to discuss the results and further brainstorm improvements would be a helpful opportunity to engage more perspectives.

Appendix 1- Phase 1 (Spring 2013) Summarization of Interview Meeting Notes

General Questions:

The first six questions on the questionnaire ask the respondent to rate aspects of the project on the following scale: 1 – low, 2 – low-medium, 3 – medium, 4 – medium-high, 5 – high. The average responses are graphed below. The data is divided into four categories: MnDOT, Contractor, Regulatory and Monitoring Oversight. Each graph is followed by a summary of feedback related to the questions.

Question 1: Time used on project for erosion control compared with other projects, including additional meetings.



Compared to other projects, how much time each week were meetings conducted and how much time was used on the project for erosion control?

The viewpoint of **MnDOT** is that a lot less time each week was spent on meetings and less time was used on the project for erosion control. There were a few high level meetings involving Design, Construction, Water Resources, and Central Office personnel. MnDOT was not responsible for measurements on this project, so a considerable amount of time on site was removed from

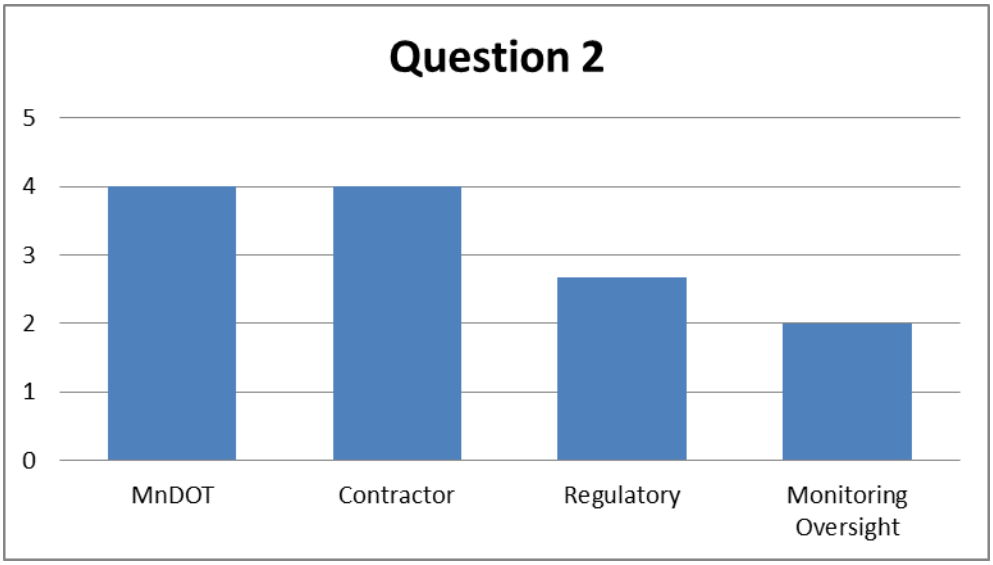
MnDOT's responsibilities.

The **Regulatory** team indicated that meetings ran longer compared to similar projects and Contractors were more engaged in the process, which they identified as positive. More time was spent on field meetings and site walk-throughs with respect to erosion control.

The **Contractor** indicated that they were on site more often than a typical job, and would be on site even more if it had been a wet year. The Contractor met with the watershed group every week. Meetings increased after rain events occurred. The Contractor indicated that during the two and a half month drier period, there wasn't any time dedicated to erosion control outside of the site walk-throughs. During the time when rain events occurred, there was a lot of time spent on erosion control and at times full days dedicated to it.

The **Monitoring Oversight** party attended a few initial meetings with the Contractor and other stakeholders. The group felt that communication was adequate with the Contractor. The weekly emails of monitoring results were helpful in providing an ongoing opportunity for stakeholder involvement and feedback.

Question 2: How strongly do you feel the need for improvement to the lump sum bidding system?



How would you improve the system and why?

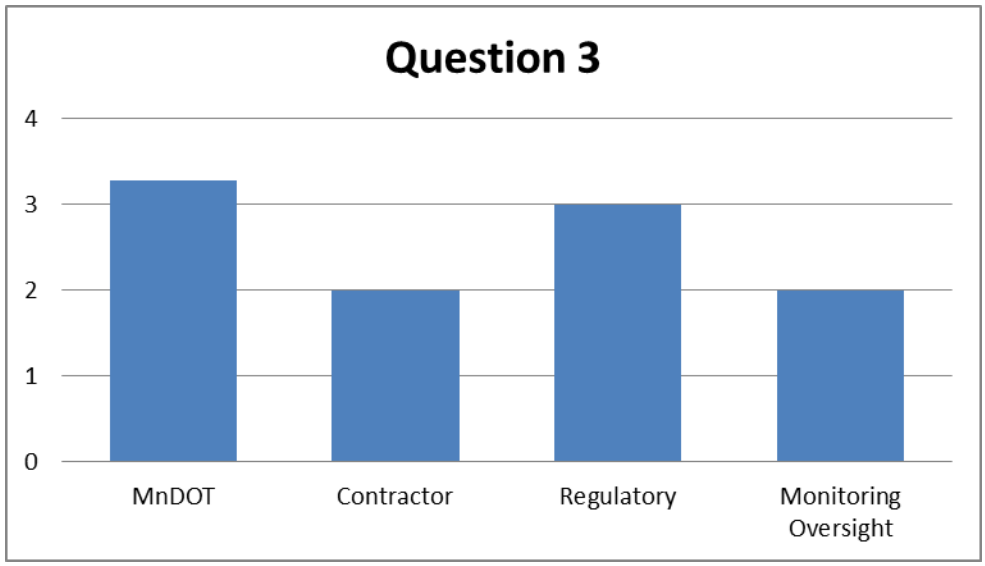
Generally **MnDOT** suggested more guidance be provided on how to implement erosion and sediment control. BMPs should be more clearly defined for typical situations in a single manual especially in temporary conditions. Currently there are multiple manuals and handbooks being referenced. Requiring sediment ponds be constructed and online at the very beginning of the project with stronger language in the contract would reduce the risk of erosion and sediment discharge. It was also suggested that a balance of risk between MnDOT and Contractor be found.

The **Regulatory** group indicated that turbidity monitoring became a secondary monitor. There was a lot of variability due to two different monitors from MnDOT and Contractor. The group also indicated that temporary sediment basins should have been used/ installed.

The **Contractor** felt that it was impossible to put in a good number for the job. They also indicated that a large responsibility was placed on the subcontractor and it is difficult for the subcontractor to bid without a strong history of working with the prime contractor. They stated that bid items help control how the money is spent on the project and suggested having bid items for all erosion control measures. Many contractors suggested that the old system is more effective and fair.

The **Monitoring Oversight** group believed that the turbidity monitoring was successful for this project. This group also suggested going back to the old system to create a fair playing field for the bidding of the project. They also suggested writing specifications to protect the concerns of the parties involved.

Question 3: Ease of staying in contract compliance/ staying in permit.



What, if any, were the difficulties of staying in permit or contract compliance?

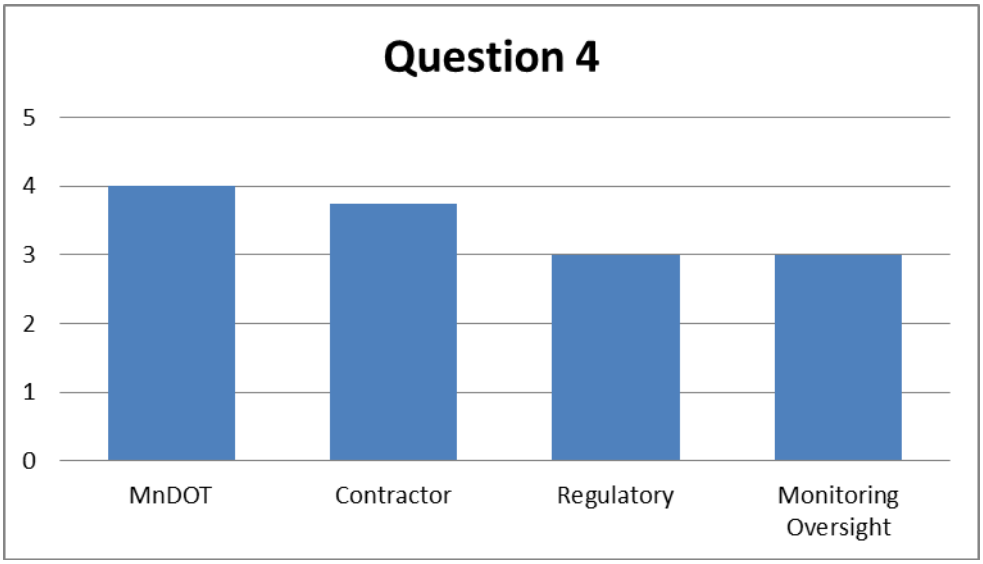
MnDOT did not identify any major difficulties of staying in permit or contract compliance. They stated the BMPs are not clearly defined.

The **Regulatory** group indicated a lack of temporary sediment basins during heavy rains which increased the risk of sediment transfer. Shifting of material was constant on this project and made it difficult to stabilize the project. The group also stated that the limits of construction for this project were too large for the BMPs selected making it difficult to stay in permit or contract compliance.

The **Contractor** did not see many more difficulties with this type of project compared to typical projects except for during heavy rainfalls. During heavy rainfalls high NBUs were found and this triggered more responses from agencies. Rock checks and other measures would also fail during heavy rainfall and it would be very difficult to stop this from occurring.

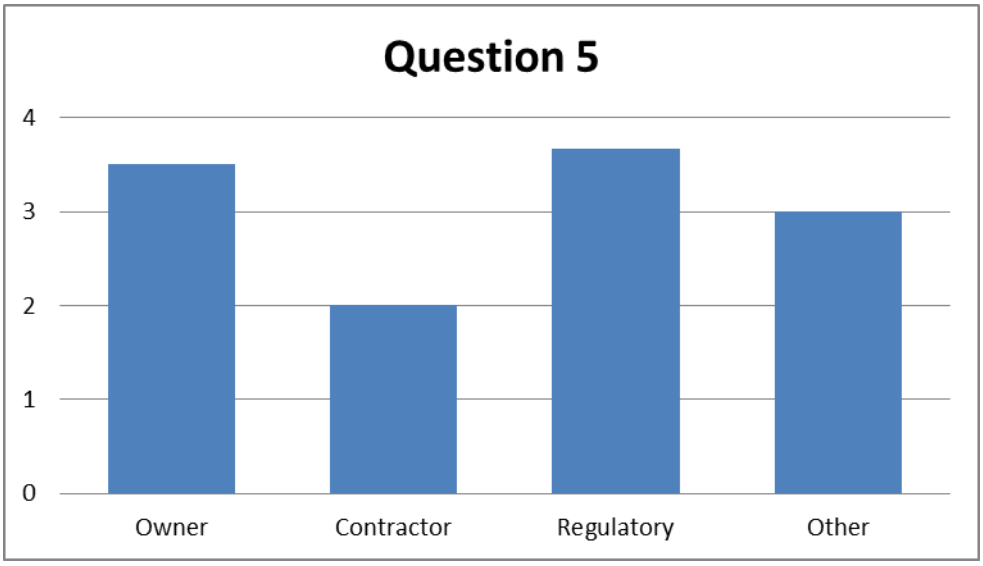
The **Monitoring Oversight** group was not responsible for contract compliance, but indicated that false indications of non- compliance could have been avoided by not having silt fence placed immediately downstream of monitoring stations.

Question 4: Ease of inspection process.



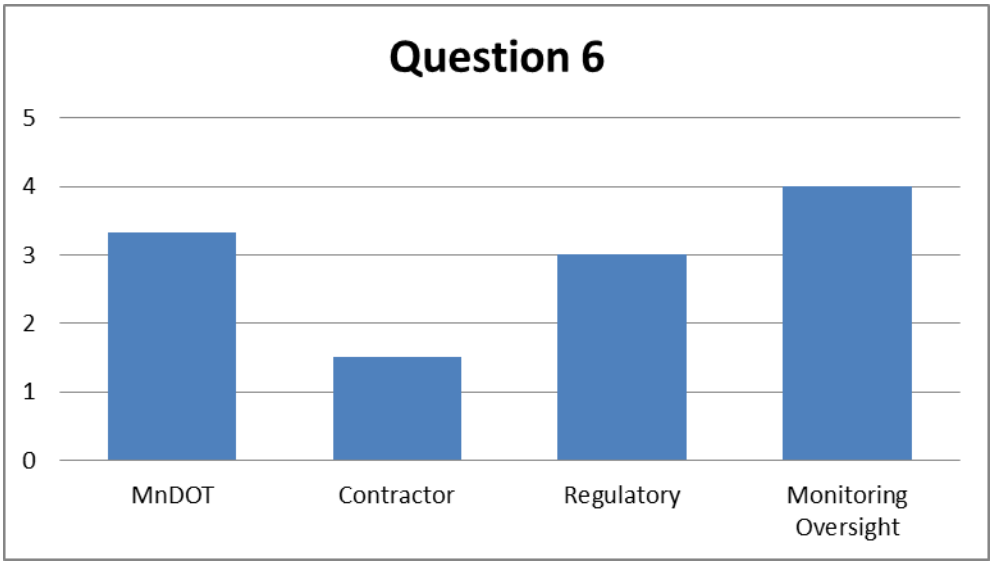
This question did not include a follow-up discussion question.

Question 5: Ease of corrective action process.



This question did not include a follow-up discussion question.

Question 6: Successfulness in risk management.



This question did not include a follow-up discussion question.

Discussion Question 7: How is the job going relative to erosion and sediment control incorporation into various stages of construction?

The general sense of **MnDOT** is that the project is going well relative to the erosion and sediment control incorporation into stages of construction. The Contractor has been both proactive and responsive to correcting any issues noted by MnDOT. Since this is a new process, additional time was required by the design unit. MnDOT did note that, had it not been a dry year, the process would not have gone as smoothly.

The **Regulatory** group feels that the job is going well considering the size of the project. The response time seems to be quicker to get erosion and sediment control BMPs in place than in similar projects. The Contractor has been taking necessary actions to remedy the situation after receiving inspection reports.

The **Contractor** feels the job is improving and there is a large amount of trust necessary between the prime and sub-contractors. The Monitoring Oversight group had no comment on this question since they simply provided turbidity monitoring to the Contractor.

Additional Comments:

The **Regulatory** group stated a need for better enforcement on out of compliance situations. More attention was paid to inlet protection on this project than other jobs. They also mentioned that exposed soils need to be covered up quickly to limit sediment transfer. On large projects, it must be assumed that there is at least one round on temporary erosion control and at least one round of erosion control on final stabilization. The Regulatory group advised to make this clear to the Contractor.

The **Contractor** advised that if MnDOT effectively performs inspections on the project, the SEQ would work fine. Furthermore, the Contractor is worried that the alternative method of bidding is a gamble because of the variability of the rain events.

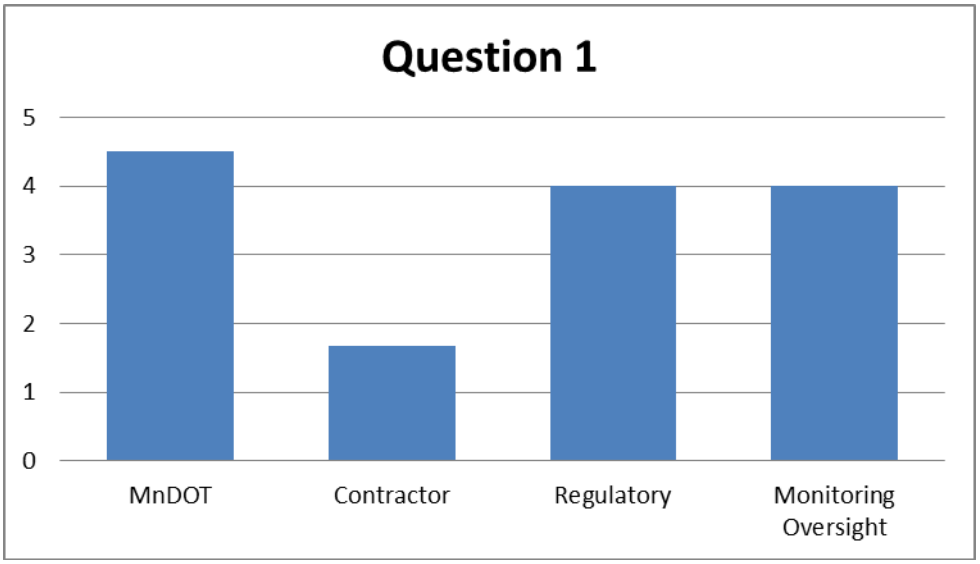
The **Contractor** feels the Statement of Estimated Quantities (SEQ) was a better method of bidding erosion control.

Bidding Process/ Cost Implications Questions:

The first eight questions on the questionnaire ask the respondent to rate aspects of the project on the following scale: 1 – low, 2 – low-medium, 3 – medium, 4 – medium-high, 5 – high. The average responses are graphed below. The data is divided into four categories: MnDOT, Contractor, Regulatory and Monitoring Oversight. Each graph is followed by a summary of feedback related to the questions.

Note most of this section did not apply to the Regulatory party since they did not deal with the administration of the contract.

Question 1: Adequacy of Information provided for bid preparation.



What information would be required so that the lump sum erosion control is a fair and equitable way of requesting a bid for the Temporary Erosion Control work?

MnDOT felt that the BMPs need to be more clearly defined but also allow the use of alternatives that perform as well or better. These alternatives would be approved by the Engineer. The current contingency, which only provides for the size of the event, should be reviewed to determine better ways to address frequent rain events. MnDOT also required the preparation of a detailed SWPPP for each stage of the project. For this project the RID was not part of the construction plan but was available for the Contractors to review.

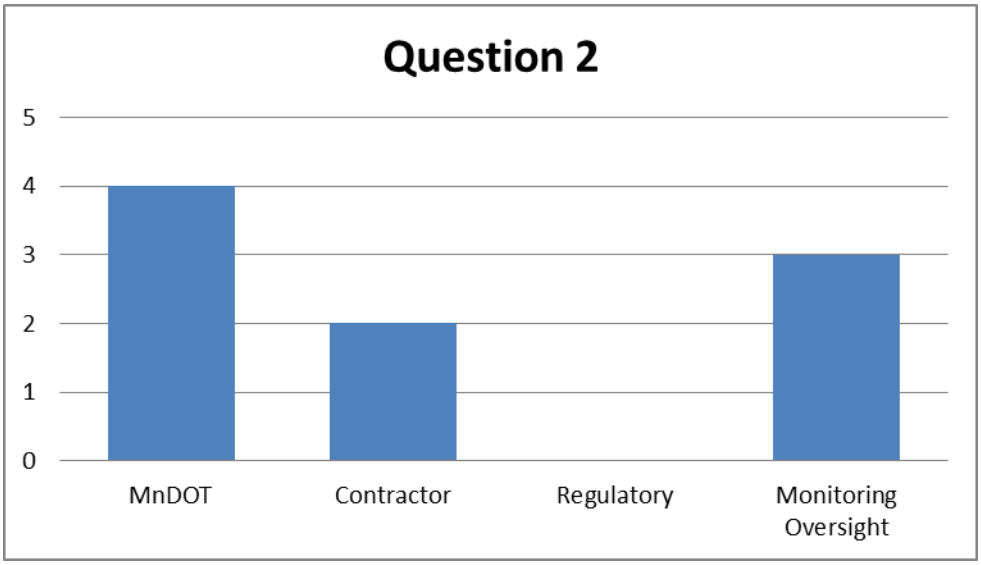
Monitoring Oversight suggestions included a temporary erosion control manual and running the project like a design- build with an upfront stipend. Finally, a pre-bid meeting was not provided; MnDOT suggested having a pre-bid meeting in the future to make these types of projects more fair.

The **Monitoring Oversight** group experienced two major difficulties. The weather and soil types on this project posed an issue. In some cases, excessive rainfall and the exposure of soils with clay minerals conductive to suspension can be underestimated or unforeseeable. They suggested that this type of project contain contingencies to cover natural conditions that are difficult to manage.

The **Regulatory** party felt that providing better drainage information would make lump sum erosion control a fair and equitable way of requesting a bid for the Temporary Erosion Control work.

The **Contractor** stated that there is no way to do a fair and equitable bid request for lump sum erosion control. A greater sum of money than what was bid was required for the project. The Contractor suggested providing bid quantities to make this type of project more fair.

Question 2: Ease of administration of the contract compared with other projects.



This question did not apply to the Regulatory party since they were not responsible for the administration of the contract.

How did the administration of the contract go versus a standard project?

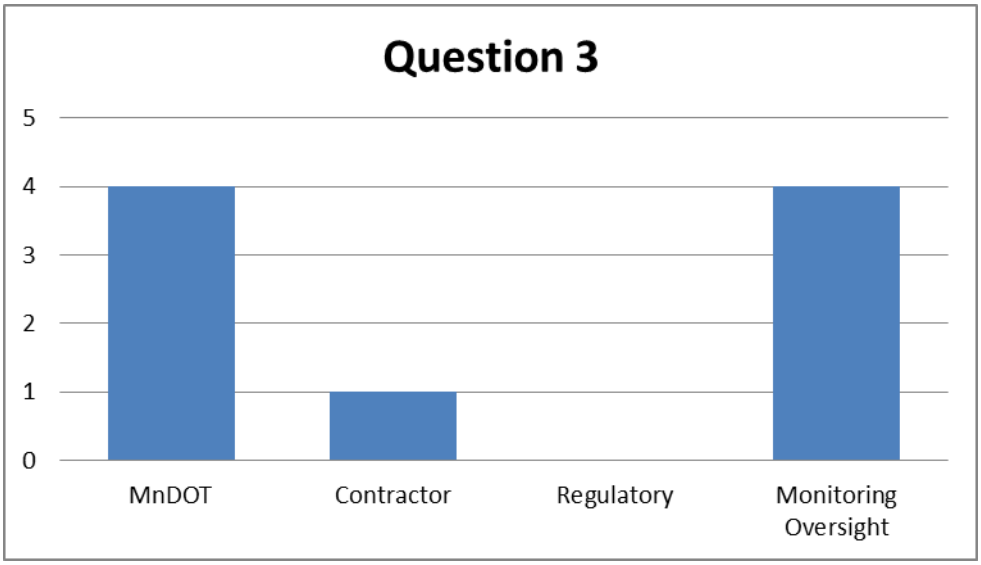
MnDOT felt that the administration went very smoothly. There was less time being spent by MnDOT administering the project versus a standard project.

The Contractor felt that the administration of the project was pretty standard. They also mentioned that there were a lot of meetings on the SWPPP, turbidity monitoring, and inlet tracking. The contractor and subcontractor needed discussions to determine who carries out certain aspects of the erosion control process and for what price.

The **Monitoring Oversight** party felt that its contractual agreement with the Contractor went well.

This question does not apply to the **Regulatory** group since they were not a part of the administration of the contract.

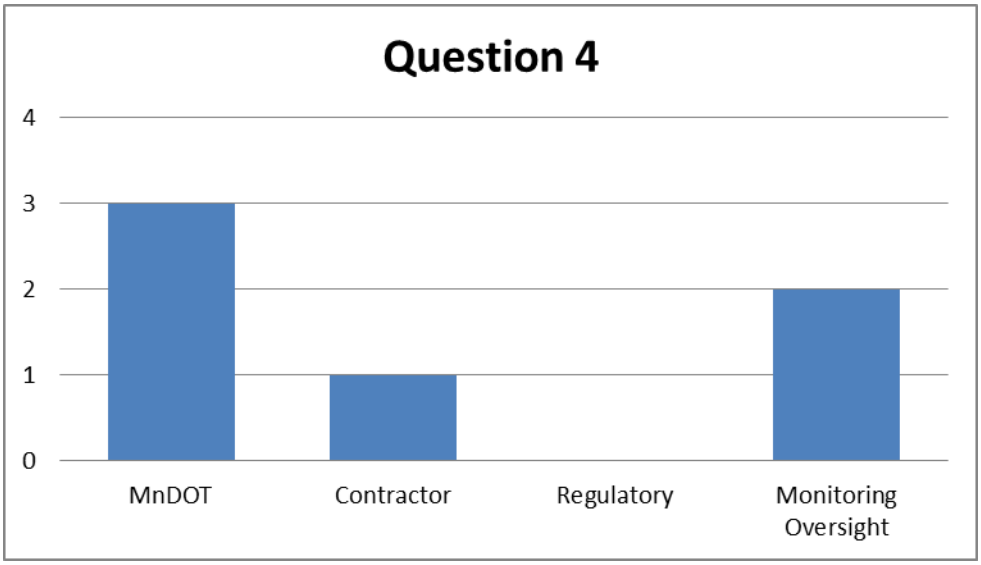
Question 3: Fairness of bid request.



This question did not apply to the Regulatory party since they were not responsible for preparing a bid request.

This question did not include a follow-up discussion question.

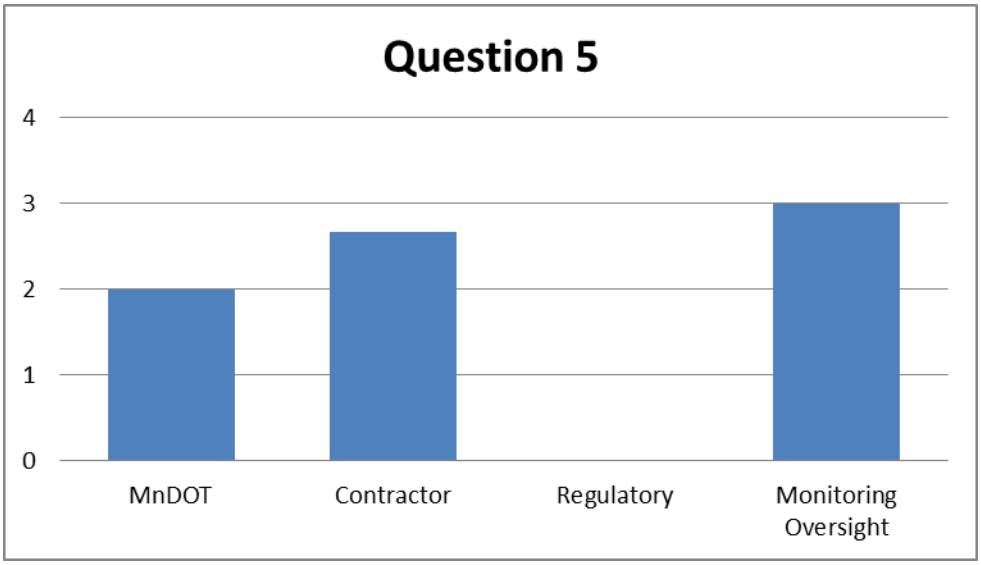
Question 4: Confidence in bid prepared.



This question did not apply to the Regulatory party since they were not responsible for preparing a bid.

This question did not include a follow-up discussion question.

Question 5: Cost of tracking BMP used.



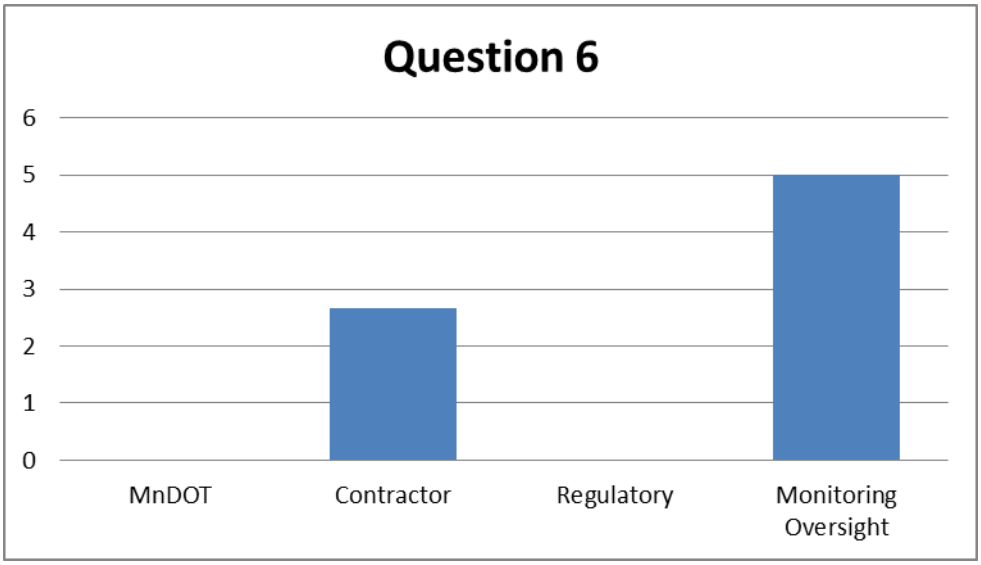
This question did not apply to the Regulatory party since they were not responsible for preparing a bid request.

What costs were triggered by each failure of the Temporary Erosion Control measures? Was it the cost of tracking the BMP used?

MnDOT took the responsibility of paying for flocculants used after the Temporary Erosion Control measures failed.

The **Contractor** paid no additional cost since MnDOT paid for the flocculants. The Contractor sited the weather as the cause of the failure because of the wind and rain events that occurred.

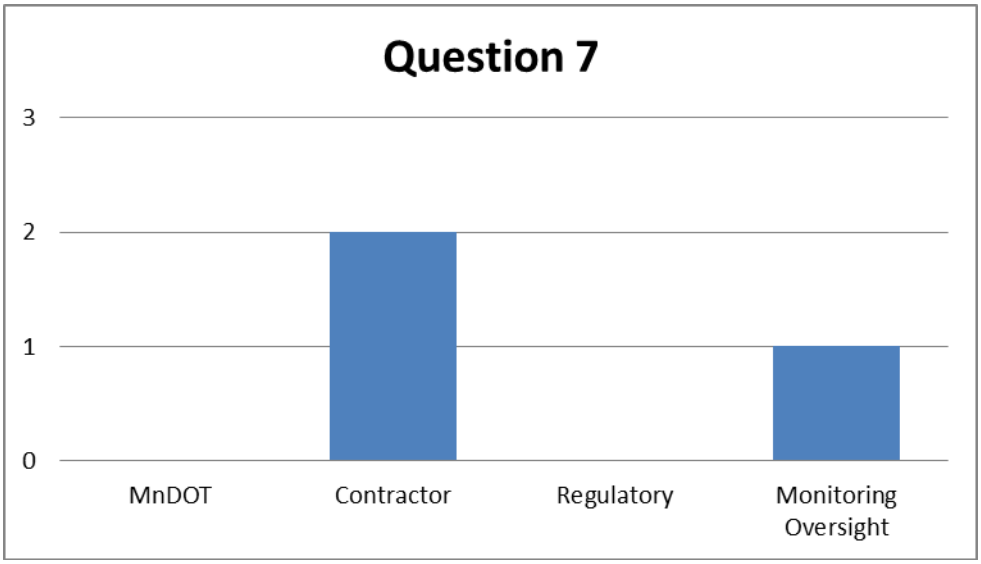
Question 6: Likelihood of bidding a lump sum erosion control project again.



This question did not apply to the Regulatory group or MnDOT since they were not responsible for preparing a bid request.

This question did not include a follow-up discussion question.

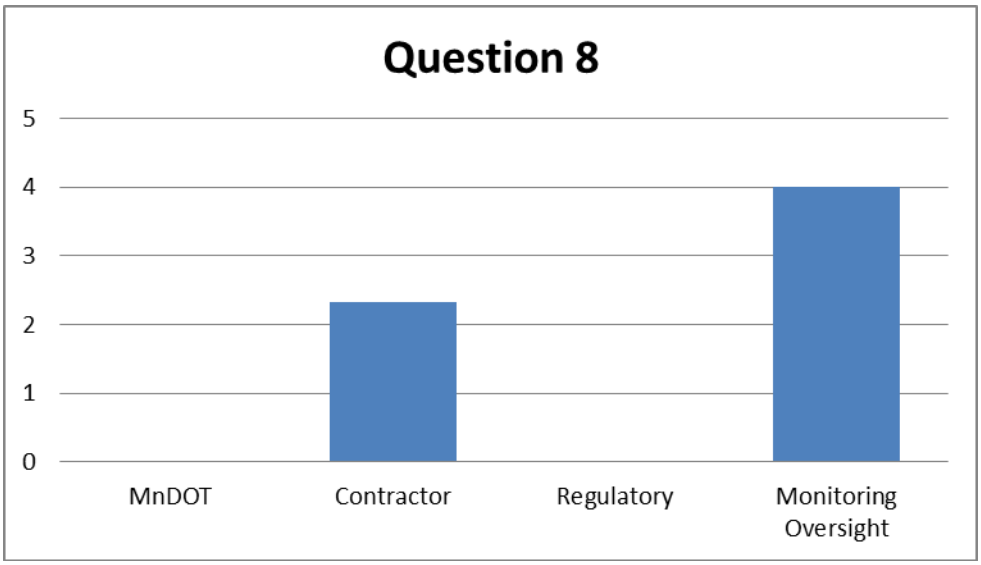
Question 7: Incentive Pay adequacy for the project.



This question did not apply to the Regulatory group or MnDOT since they were not responsible for preparing a bid.

This question did not include a follow-up discussion question.

Question 8: Successfulness of bid relative to costs of compliance.



This question did not apply to the Regulatory group or MnDOT since they were not responsible for preparing a bid.

This question did not include a follow-up discussion question.

Discussion Question 9: Last year, 2012, was a dry year except for one large rain event. Has the lump sum amount for erosion control on the project been depleted?

MnDOT felt that summer and fall were dry but last spring was very wet and not simply due to one rain event. MnDOT questioned how decisions will be made if the Contractor claims the money for erosion and sediment control has been depleted and how will this be validated.

The **Contractor** indicated that the lump sum amount has not been depleted at this time. The Contractor also brought up the multiple rain events that occurred in May and sited them as an issue.

The **Monitoring Oversight** group indicated that the monitoring and reporting of turbidity did not change based on the amount of rainfall.

Discussion Question 10: What will happen when the lump sum amount is depleted and there is still work to be done on the project?

MnDOT stated that the expectation is to carry on with the project as ~~a~~ bid. MnDOT said that the Contractor will have to become more efficient to avoid the depletion of funds.

The **Regulatory** group thought there were remedies set in place to account for this.

The **Contractor** indicated that they will continue to work on the project and address issues identified by the other parties, but this is a source of concern for the subcontractor. The subcontractor will lose money if there is more work to be done after the lump sum is depleted. The Contractor also advised having more requirements, especially regarding temporary erosion control.

The **Monitoring Oversight** group intends to uphold its contractual obligations with the Contractor if the lump sum is depleted before completion.

Additional Comments:

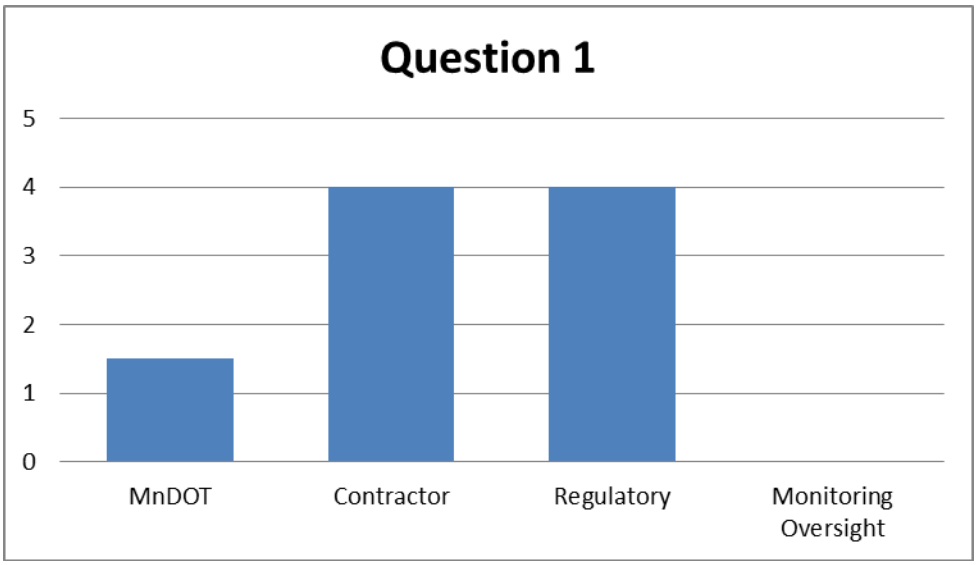
The **Contractor** indicated that there would be higher costs all around for the subcontractor had it not been such a dry year. They also suggested spreading out the payment of the job prorated over shorter amount of time based on high amount of activity in rainy months. They also want MnDOT to keep the flocculation as a time and material.

Specifications and Monitoring Questions:

The first six questions on the questionnaire ask the respondent to rate aspects of the project on the following scale: 1 – low, 2 – low-medium, 3 – medium, 4 – medium-high, 5 – high. The average responses are graphed below. The data is divided into four categories: MnDOT, Contractor, Regulatory and Monitoring Oversight. Each graph is followed by a summary of feedback related to the questions.

Note that the Monitoring Oversight party was not involved in this process and only prepared a lump sum cost estimate to the Contractor for turbidity monitoring.

Question 1: Ease of SWPPP development.



This question did not apply to the Monitoring Oversight group since they were not responsible for developing the SWPPP.

How did the SWPPP development go (had RID SWPPP vs. contractor developed SWPPP)? What could be done differently?

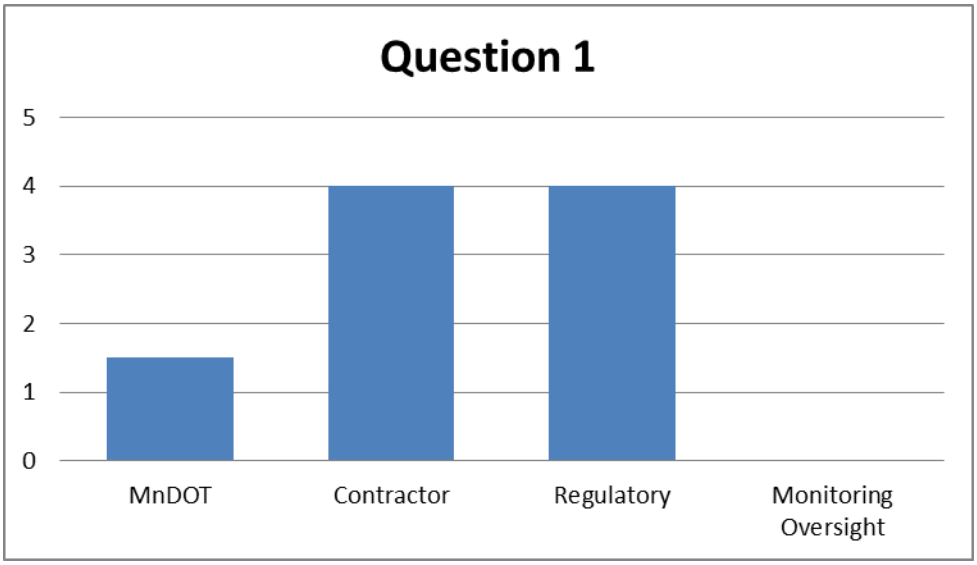
MnDOT indicated that the approval of the construction contract is contingent on the SWPPP. To ensure the SWPP does not unnecessarily delay the approval of the contract, MnDOT suggested there be a time frame for SWPPP submission. The Contractor and SWPPP designer need to be informed that there is an MOU in place between MnDOT and the MPCA. They also stated that the SWPPP for the RID was more involved and time consuming than a typical project. The Contractor primarily used what was provided in the RID.

The **Regulatory** party felt that the SWPPP development went well. The field inspectors were

given a chance to comment on the SWPPP beyond the normal permit process which is not typical.

The **Contractor** indicated that an outside party did the SWPPP and it was paid for out of pocket by the subcontractor. It was recommended that in addition to the 3 inch, 24 hour storm threshold, MnDOT add a threshold for a higher intensity shorter duration rain event being paid for by MnDOT. The Contractor wanted temporary drainage included in the SWPPP.

Question 2: Need for additional BMP methods and processes.



This question did not apply to the Monitoring Oversight group since they were not responsible for the BMP methods and processes.

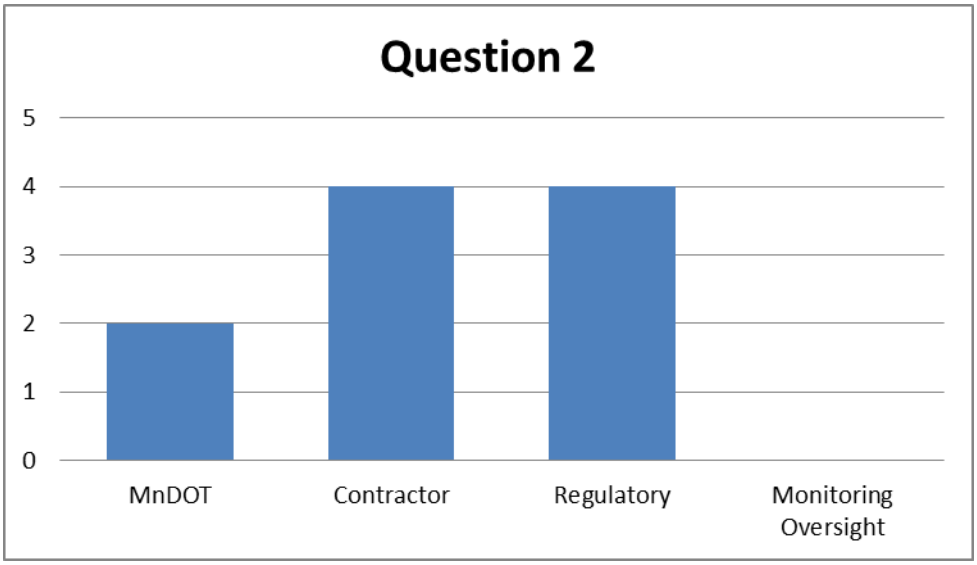
How should we modify the Temporary Erosion Control Lump Sum specification to make it more effective and efficient?

MnDOT's main suggestion was to better define the BMPs. This would include defining the BMPs for long-term temporary stabilization as well as specific time frames for completion of sediment ponds and getting them online. MnDOT also suggested improving the system for turbidity monitoring to make the payouts fairer year-round. MnDOT would advise including more information on the permit process to provide more guidance to the contractors on how to design a temporary erosion control plan.

The **Regulatory** party suggested requiring temporary sediment basins be constructed early in the phasing to prevent turbid discharges and identified this as the biggest issue with the Temporary Erosion Control Lump Sum specifications. They also suggested better enforcement of specification language to ensure practices are in place prior to the next rain event.

The **Contractor** felt that turbidity monitoring should be taken out of the contract and a better method of compliance be used. The contractor felt the specifications book needs different provisions on the length of the blanket at the inlet. The Contractor also mentioned that specifications should include temporary drainage, seeding, and mulching since these factors can greatly increase the cost of the project. They also felt that if erosion control components are kept as bid items, there is more control over how the money is spent.

Question 3: Need for exclusion of some BMP methods and processes.



This question did not apply to the Monitoring Oversight group since they were not responsible for the BMP methods and processes.

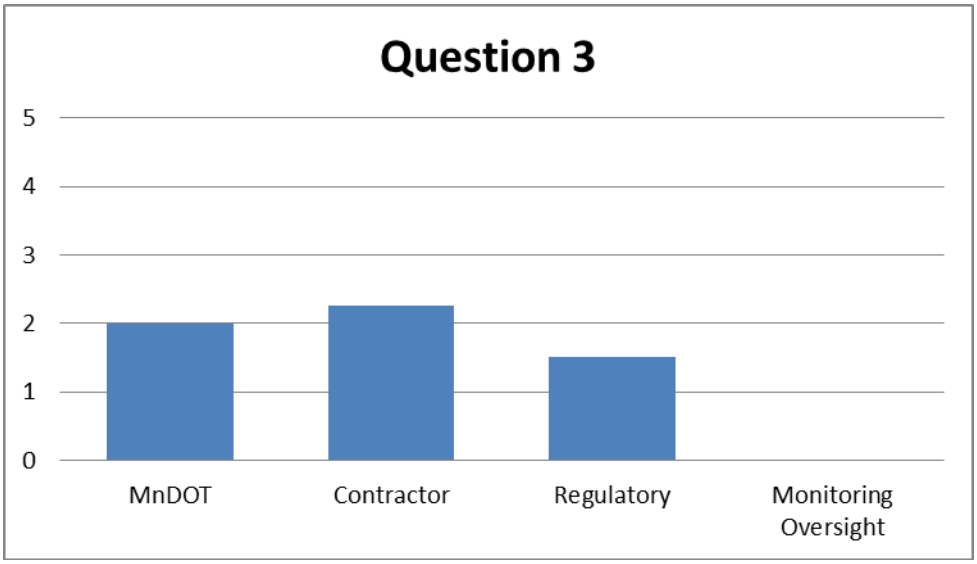
Are there other BMP methods or processes that should be excluded? Should there be more restrictions of the use of some BMPs? Are there gaps in the provisions that you would do differently today?

MnDOT advised more robust measures in situations where Hydromulch/ seed are used on locations where little to no vegetation is expected to grow. This would help ensure that the mulch does not wash away before the Contractor reapplies it and thus presents erosion issues. MnDOT stated that the BMPs are standard throughout but, because there was atypical soil throughout the job, special provisions had to be made and paid for by MnDOT. A temporary erosion control manual would be helpful.

The **Regulatory** group felt the BMPs used were appropriate and in place in a timely manner. They advised not to rely so much on silt curtains because when the sediment has reached the lake it is too late to filter out.

The **Contractor** found the BMPs very similar to other projects. In this project, however, Category-4 blankets were required. The Contractor feels the NTU limits were too low and that the threshold should increase. The Contractor also found that in some cases biologs failed and should be replaced by rock logs since the biological material can float and be washed away.

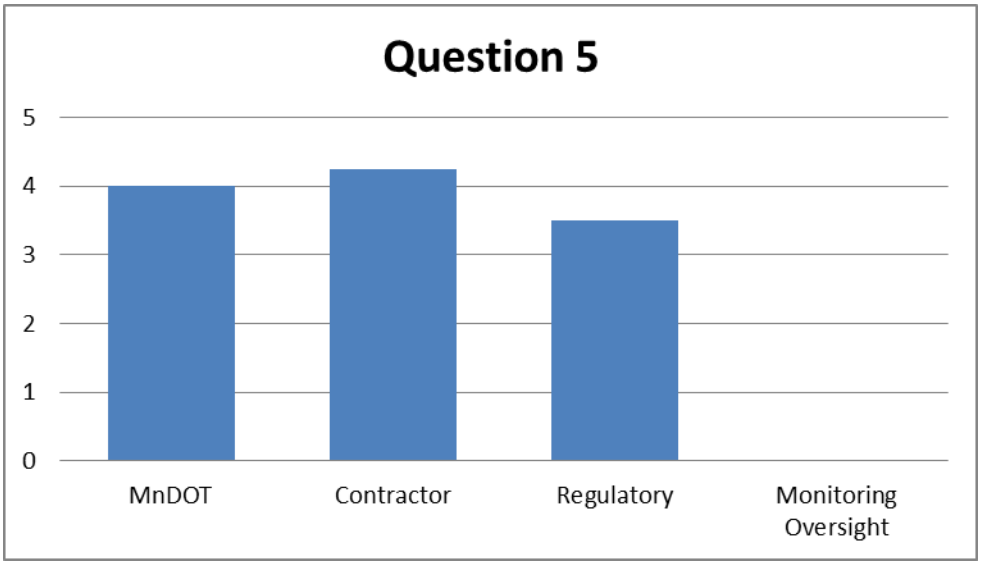
Question 4: Effectiveness of water quality methods.



This question did not apply to the Monitoring Oversight group since they were not responsible for the effectiveness of water quality methods.

This question did not include a follow-up discussion question.

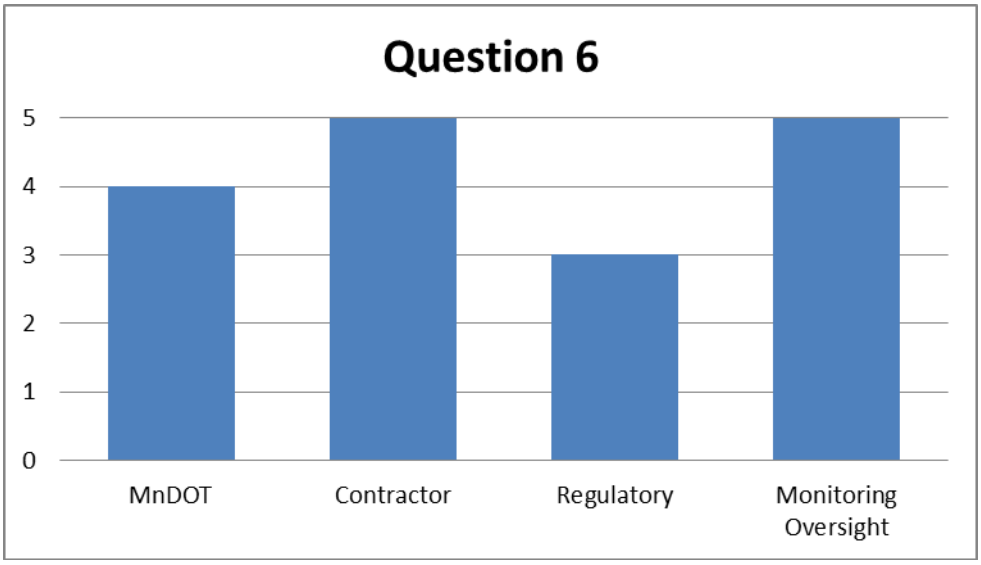
Question 5: Contractor compliance with Contractor developed SWPPP.



The Monitoring Oversight group had no comment on the matter.

This question did not include a follow-up discussion question.

Question 6: Ease of turbidity monitoring for staff.



This question did not include a follow-up discussion question.

Discussion Question 7: Did any specific BMPs used under the contract fail? If so, when, how, and why did they fail?

MnDOT indicated failures of perimeter control and inlet protection as well as slope failures due to heavy rainfall. The sizes and grades of the slopes were important factors as well as the volume of water that was present. There were hydromulched/ seeded slopes that had significant erosion before the reapplication of the mulch/ seed was performed. Due to the early and wet spring, the ditches could not hold the water flows. Multiple methods were attempted to counteract this and eventually ditch checks and hay bales worked, but flooded out the work zone.

The **Regulatory** party indicated that the volume of runoff coming from the site overwhelmed the BMPs in place. Although the open area did not meet requirements to have a temporary sediment basin, one should have been used to prevent repeated turbid discharges. The contractor eventually created temporary storage to minimize the discharges. The group also mentioned problems with temporary ditch stabilization and the excavation of temporary sediment traps/ basins.

The **Contractor** indicated that the Category-3 blanket failed until the second pond was online. This required the Contractor to switch to a Category-4 blanket after a heavy rainfall. The Category-4 blanket was more expensive but worked significantly better. The Contractor also indicated that the silt fence did not work very well and a heavy duty silt fence had to be used. The biologs sometimes failed during heavy rain events and were washed away. This could be mitigated by using rock logs instead or a series of blankets and biologs.

Discussion Question 8: How do you address issues that are technically compliant but differ from areas we would typically add more specifications? Was the application appropriate for this BMP? Was it installed or maintained properly?

MnDOT once again suggested better defining the BMPs for the project. They also suggested weekly walk-throughs of the site to discuss future potential problems that they would recommend fixing.

The **Regulatory** group suggested using more temporary sediment basins than were technically required to achieve runoff goals.

The **Contractor** suggested good cooperation with MnDOT on the walk-throughs to catch areas of concern.

Discussion Question 9: Did the contractor or administrator fail to anticipate the magnitude of a storm or rainfall event? If so, why? What specific storms or rainfall events tested the Temporary Erosion Control measures? Did any specific event trigger extra work? Why and how?

MnDOT indicated that due to the clay soil present on this project, even a small amount of rain can be problematic when many acres of soil are disturbed. Basic compliance does not ensure that the downstream water resource is adequately protected. In some cases the Contractor followed basic compliance and downstream water resources were negatively affected. MnDOT took responsibility for larger events and the Contractor took responsibility for smaller events.

The **Regulatory** group indicated that turbid discharge events were usually triggered by an inch or more of rain. The specifications call out a 3 inch, 24 hour storm that MnDOT is responsible for paying. This is not a high threshold and it should not decrease from that.

The **Contractor** indicated one major rain event that was not anticipated due to the magnitude of the storm event. The Contractor mentioned that they had prepared for a 1 in to 1 ½ inch rain event when a 2+ inch rain event occurred. The measures taken for the smaller storm event did not hold up and even after adjustments were made there was not a lot of success in erosion and sediment control. After the roadway was in place, that area was more manageable.

Discussion Question 10: Was drought or wind erosion a problem? How so?

MnDOT identified wind and dust as an issue and caused erosion of stockpiles. The soil would track wet or dry. The Contractor did not have adequate equipment for watering the area as a bridge in the area was being demolished. Water for dust control was covered in the specifications.

The **Regulatory** party also observed dust problems but mentioned that the problems were quickly minimized by the Contractor by using stormwater from temporary sediment basins to apply to the site.

The **Contractor** stated that the seed did not take due to dryness and the Contractor had to Hydroseed multiple times. The Contractor attempted to keep the soil wet to minimize dust transfer, but it would then track. Woodchip and rock entrances and exits were used but neither were very effective. Eventually the Contractor used a procedure of tracking then sweeping to minimize sediment transfer. They worked to keep workers and trucks off of the soil and on the blacktop as much as possible but that was not very plausible. In dry conditions, the soil became dust-like, and then when it rained all of the dust-like soil was mobile.

Additional Comments:

The **Contractor** stated that the monitoring went well since they were only responsible for installing the monitors.

Appendix 2- Phase 2 (Spring 2014) Interview Notes

General Questions:

How does the time spent on this project for erosion control compare to the time spent last year?

- Way less on Temporary Erosion Control, yet MnDOT required a lot of meetings.
    - Chose to install permanent erosion control ASAP to avoid hassles of temporary.
- Push this year to get permanent seeding established.
- Weekly meetings helped stay on top of things.
- Less this year.
    - Different weather
    - Type of work this year not as environmentally sensitive.
- About the same or worse as last year. The wet spring made it difficult to get started.

How strongly do you feel the need for improvement to the system? Has anything changed from last year?

- High need for improvement.
    - Felt that MnDOT required a lot of things to address issues and then categorized them as Temp Erosion Control to avoid having to pay for them. Need clearer description of what can be classified as temporary erosion control.
- Turbidity monitoring is troublesome; data is questionable.
    - More clarity needed on expectations for monitoring.
- Improvements needed:
    - Monitoring – web based reporting
    - Incentives – more $/more requirements
    - Permitting – clarifications (particularly on the 30-day review period)
- Feel very strongly that the Lump Sum system should go away.
    - There is too much risk passed to the Contractor and no equity in getting paid for extra work.
    - Though a purpose of Lump Sum is to lighten the oversight work for MnDOT, they were involved in every detail throughout anyway.

Have there been any improvements to the ease of staying in contract compliance / staying in permit?

- All parties worked together well to communicate the needs for the project.
- No change in response from Contractors, benefit of method is less admin for field inspectors.
- There is not enough information on how a Contractor is expected to prepare an erosion control plan.
- No improvement

Have there been any changes to the ease of the inspection process?

- No. There was no inspection.
- Less field coordination, administration, and measurement.
- Two concurrent jobs w/ different methods highlighted the difference in work required. Other traditional project required a lot more field time.
- Lightens staffing load for field inspectors.
- Web-based monitoring
- Felt the inspection process was the same, yet there was more work for the Contractor with less pay.

Have there been any changes to the ease of the corrective action process?

- Only that everything was paid for by the Contractor.
- Weekly meetings allowed for constant communication.
- Lump Sum incentivized compliance and reduced needed corrective action.
- Perhaps a little more incentive bonus would help compliance more.
- With a clearly defined rainfall threshold, it was easier than normal projects to administer the project.
- There was a large amount of rain and the oversight groups recognized the difficulty of the wet spring.

Successfulness in risk management:

a. How does this rate with respect to the subcontractor?

- Required subcontractor to get involved in project more than what he would usually expect in order to be aware of changes or issues.
- It was much more difficult to coordinate the work.

b. How does this rate with respect to weather?

- Just hope you don't get a lot of rain.
- Shifts most of the risk to the contractor.
- Easier to manage risk.

c. How does this rate with respect to project staging?

- Works fine for the Prime, but doesn't work well if he doesn't coordinate well with subcontractor.
- Up to the Contractor to decide how much to open the project up.
- Communication between Prime and sub must be emphasized if staging is changed.
- Forced Contractor to give more thought to staging and final stabilization.
- Minor changes. Contractor just followed the MnDOT provided staging plan.

d. How does this rate with respect to winter work?

- Everything just falls under the Lump Sum instead of permanent erosion control.

Additional Comments:

Old culverts washing out made it difficult to keep water clean for the project when it turned out to be more than just construction materials to treat.

Bidding Process/ Cost Implications Questions:

How did the administration of the contract go versus a standard project this last year?

- N/A – just focused on field work. No admin required.
- Not any more/less work than normal, just didn't get paid for the work.
- This year there was more urgency to complete the project and not as much consideration was given to keeping compliance; more prodding was required.
- Significantly less work for field staff/same amount of work as usual for engineers
- Less book-keeping with no measurements required from MnDOT.
- Good relationships between Prime and Subs required.

What information would be required so that the lump sum erosion control is a fair and equitable way of requesting a bid for the Temporary Erosion Control work?

- No amount of information could make this equitable.
- The system is not good for anybody. It is not likely that both MnDOT and Contractor come out equal. Either MnDOT pays for work that doesn't need to be done or the Contractor does work that doesn't get paid for.
- A useable Erosion Control Plan to default bid would make it easier for Contractors to set expectations.
- Pre-letting conference for Lump Sum Erosion Control with Sub-Contractors in attendance to clarify project details and specifications.
- Without a required staging/erosion control plan, it was difficult to bid; particularly for the Subcontractor who couldn't get staging concepts from the Prime without compromising the Prime's bidding process. Sub might be bidding for multiple Primes so the Primes won't want to share their Staging and Erosion Control Plans. How can the Sub properly bid on the project without this information?

What costs were triggered by each failure of the Temporary Erosion Control measures over the past year? What is the cost of tracking the BMP items used?

- MnDOT was fair in helping correct field issues quickly, just didn't get paid for it.
- Flocculant was a grey area in specs creating some extra costs.

This year, 2013, was a dry year except for a wet spring. Has the lump sum amount for erosion control on the project been depleted?

- Yes. Way more work was required than anticipated and the budget was depleted quickly.

What will happen when the lump sum amount is depleted and there is still work to be done on the project?

- Work without getting paid, however this greatly decreases the motivation to do quality work.
- MnDOT would administer the work the same way.

- Work for free. Contractor takes ownership of a project and wouldn't leave it in poor condition so the work will be done without getting paid.

Additional comments:

Kevin Hagness and Steve Barrett worked hard to make the Lump Sum item work by communicating often with contractors.

Great benefit of Lump Sum is that it allows the contractor to take ownership of the project. They can use their own expertise to do a job the way they think it would best be done.

Without clear definitions of what is considered Temp Erosion Control, the Contractor felt abused when everything seemed to be forced into that category.

The additional amount of work required for the subcontractor makes it impossible to make any money on these types of projects forcing the Prime to take on the work and driving smaller contractors out.

It feels like MnDOT really doesn't care about the Contractor's perspective in this study since they are already moving forward with more changes to the specs for more projects without even seeing the results of this report.

Specifications and Monitoring Questions:

Are there BMP methods or processes listed in the specifications that should be excluded?

- The specs allowed a good amount of freedom.
- Specs aren't prescriptive enough.

Should there be more restrictions of the use of some BMPs?

- Already too many restrictions.
- There shouldn't be any specs. Instead of specs there should be a list of approved materials and methods that they should be free to apply at Contractor's discretion.
- Specify particular areas where hydroseeding should not be allowed.
- Specs should be outcome based. Use outside documentation to point to expectations and processes.

Over the past year, did any specific BMPs used under the contract fail? If so, when, how, and why did they fail?

- At retaining wall #2, water was still dirty with blanket, bio rolls, and flocculant.
- 72" pipe had turbidity issues resulting from changes in staging.
- A lot failed in the 1st year – particularly at the lake
    - Too much rain
    - Overwhelmed BMPs
    - Required extra BMPs beyond technical compliance

Over the past year, how do you address issues that are technically compliant but differ from areas we would typically add more specifications?

- Felt that more is better so we went above normal specs to avoid greater risk of needing to clean the lake.
- Allowed to try it with clear understanding of disagreement and suggested back up plan.
- Let it go and add more if it fails.
- Don't remember getting paid for extra work. Rainfall events were light but extended and repeated so it was always wet but not enough at one time to exceed the threshold.

Is the standard 2.5 inches rainfall event an adequate threshold for such risk?

- The threshold is too high; too rigid. Multiple days of 2.4 inch rain can be much more damaging than one 3 inch rain.
- Consider a threshold based on soil saturation, not on rainfall. Different soils can handle different amounts of rainfall.
- Not sure what the threshold should be but a line is necessary to determine payment.
- Longer periods allow verification of measurements from other sources. Having quicker verification from other sources of measurement would help during high frequency periods.

- 2.5 inch storms usually happen quickly, not over an entire day. This makes it difficult to apply the threshold to every situation.
- 3 inches is slightly larger than a two-year storm. A two-year project should expect at least one storm.

Was drought or wind erosion a problem this past year? How so?

- Seeding and watering was difficult.
- Permanent turf establishment was difficult.
- No watering item for turf establishment in contract. Difficult to require watering when there is no clarity for how it is paid for.
- High amount of wind erosion.
    - PCA didn't enforce regulations so it made it difficult for MnDOT to enforce anything.
    - BMPs not developed enough for wind erosion.

Additional comments:

Tracking all projects will be difficult with such variability. Some projects are going to be a loss for MnDOT and others a great gain. There will be no way to estimate Erosion Control on future projects with this variability.

There was nothing to refer to in order to find out what products are preapproved for use on the project.

It was nice to be the expert and use my skills to determine the best methods and not be forced into MnDOT's design.

Ongoing communication and coordination between MnDOT and Contractors helps things go much smoother.

Propose that all parties meet together after this report to share concerns and brainstorm constructive solutions.

There appeared to be a real lack of knowledge on purposes and methods of erosion control. There is a big learning curve ahead to get everyone on the same page.

Conversations around methods are more productive with the Contractors than contracts/payments.

What would be a better method? The way it used to be.