February 02, 2015

BerryDunn

Independent Review

Department of Corrections Health Information Technology Electronic Health Records Upgrade Project

V1.3

For the State of Vermont
Department of Information & Innovation and Department of Corrections

Submitted to the State of Vermont, Office of the CIO by:
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January 29, 2015

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Table i: Version History

Draft Type	Delivery Date	Version	Description
Working Draft	December 23, 2014	v1.0	Initial submission
Final Draft	January 3, 2015	v1.1	Revised based on feedback from DII OPM
Final	January 22, 2015	v1.2	Revised based on feedback from CIO and Commissioner of DII and information received after completion of the original assessment
Final for Approval	January 29, 2015	V1.3	Revised based IR reporting meeting discussion.

1.0 EXECUTIVE SUMMARY

The State of Vermont's (State) Department of Information and Innovation (DII) and the Department of Corrections (DOC) engaged Berry Dunn McNeil & Parker, LLC (BerryDunn) to conduct an Independent Review of the State's proposed acquisition of an Electronic Health Records (EHR) System from CorrecTek. State of Vermont statute requires DII to solicit an Independent Review for all information technology (IT) projects estimated to exceed $1,000,000, or at the discretion of the State Office of the Chief Information Officer (CIO). The State CIO sought an Independent Review of this EHR System replacement with regards to the following aspects of the project: proposed acquisition costs, technology architecture, implementation plan and risks, cost/benefit, and impact on the State's net operating costs. The primary objective of the Independent Review is to identify risks that may impact the success of the IT project and help the State develop associated risk strategies and responses.

The DOC Health Services Division (HSDiv) is the division within DOC that is responsible for the provision and oversight of a program of "comprehensive and integrated health care services" (otherwise referred to as health services) to inmates (pre and post adjudication) at all correctional facilities located throughout the State. DOC provides inmate health services as guaranteed by the 8th and 14th Amendments to the United States Constitution. The Division also assists in oversight of health services for DOC's out-of-state supplemental housing component, which is provided through a separate contract. On May 6, 2014, the DOC issued an RFP for Comprehensive Healthcare Services for Inmates, and then re-issued an RFP for these services on August 12, 2014. As a result of the re-issuance of the RFP, the DOC has selected a preferred vendor to provide the Comprehensive Healthcare Services for Inmates, including the implementation and operation of an EHR system.

The preferred vendor, Centurion, originally proposed an EHR system that was not "2014 Meaningful Use Compliant." Because of this, the State asked Centurion if they would partner with CorrecTek as the EHR system vendor (CorrecTek was originally proposed by another health services vendor). Centurion agreed and provided the DOC with a revised proposal to reflect this change. With this agreement, a third vendor was introduced, Kalleo Technologies, who is the hosting services partner for the "CorrecTek Cloud" solution. The resulting contract between the DOC and Centurion is being developed to reflect a single contract vehicle (between the DOC and Centurion) and a provision for Centurion to contract directly with CorrecTek and Kalleo to provide a hosted EHR system. The DOC reports that the contract with Centurion will indicate that Centurion will contract with CorrecTek and Kalleo "on behalf of the State," will be the holder of the CorrecTek license, and will include language that indicates that the CorrecTek license is to be transferred to the State based on a set of criteria.

As part of the Independent Review, the BerryDunn team interviewed DOC members and staff, DII staff, and representatives from CorrecTek, Centurion, and Kalleo Technologies. Additionally, DII and DOC staff provided BerryDunn with several relevant documents to inform the reviews. BerryDunn researched industry standards and best practices, as well as leveraged our experience with EHR systems in a correctional setting.

The following sections of the Executive Summary summarize key points from each of the areas assessed during the Independent Review, as well as high impact and/or high probability risks and BerryDunn's overall recommendations regarding whether or not to move forward with the preferred vendor and solution.

1.1 Cost Summary

Table ES.1 summarizes costs from the acquisition cost assessment, cost-benefit analysis, and analysis of impact on net operating costs.

Table ES.1: Cost Summary

IT Activity Lifecycle:	5 years
Total Lifecycle Costs:	$1,250,530
Total Acquisition Costs:	$747,168
New Annual Operating Costs:	$0 (as reported by the DOC)[1]
Difference Between Current and New Annual Operating Costs:	$0[1]
Funding Source(s) and Percentage Breakdown if Multiple Sources:	General Fund

1.2 Disposition of Independent Review Deliverables

Table ES.2 provides highlights of each area reviewed in the Independent Review, including any major concerns identified.

Table ES.2: Disposition of Independent Review Deliverables

Deliverable	Highlights from the Review
Acquisition Cost Assessment	Acquisition costs are **$747,168**. The DOC reports that they are negotiating a deliverables-based payment model to address these costs (with the possible exception of hard costs such as Hardware Costs (estimated to be $19,000) and prorated hosting fees during implementation (estimated to be no greater than $74,808). The software license fee component of the acquisition cost is $142,546, which seems reasonable based on the size and complexity of the Vermont DOC.
Technology Architecture Review	The proposed EHR system will be hosted at a third party location (Kalleo). Technology controls are being included in the EHR system contract to address service levels, backup and recovery, and security in support of the DII strategic direction. The EHR system implementation is significantly similar (from a technical architecture perspective) to the DOC's recent Offender Management System implementation. Because of this, many of the technical barriers have been identified and addressed.

[1] No new operating costs are anticipated based on the implementation of the new EHR system; instead an overall gain in operational efficiency is expected based on industry best practices.

Deliverable	Highlights from the Review
Implementation Plan Assessment	There are multiple dynamics associated with the implementation of the replacement EHR system, including: • There are three vendors participating in the EHR implementation process: Centurion (the primary vendor), CorrecTek (the EHR system vendor), and Kalleo Technologies (the hosting services provider) • Centurion has not implemented the CorrecTek system previously • Current health services staff, provisioned via Correct Care Solutions (CCS), the incumbent inmate health services provider, will transition to become Centurion staff in early 2015 • The legacy EHR system will remain active until February 1, 2016, after which it will no longer be available to manage health records • The implementation timeline for the CorrecTek EHR system ranges from nine months to 15 months, with an average timeline of 12 months The DOC is negotiating a single contract for the implementation and operation of the EHR system with Centurion (the vendor that will also provide the health services). Centurion will contract with CorrecTek and Kalleo, and will lead the implementation of the EHR system, then manage the ongoing operations of the system. Because the EHR system must be implemented within a 12-month timeframe (assuming the contract is executed on or about February 1, 2015) due to the availability of the legacy EHR system, CorrecTek is proposing an accelerated implementation plan with an EHR system go-live period of the end of November, 2015. They are working with the DOC to develop the strategy and increase the likelihood that this timeline will be met. This provides the DOC and CorrecTek with a two-month slack period with which to work should the implementation timeline slip. Multiple risks are provided in Appendix B regarding the implementation approach. The DOC has proactively identified reasonable mitigation strategies for them.
Cost-Benefit Analysis	Although no intangible benefits were articulated by the DOC at this time, several important quantifiable tangible benefits have been identified, which are listed in Section 8. Based on our experience, these “opportunity cost” benefits, although not directly resulting in a reduced operational budget for the DOC, are anticipated to enable the DOC to increase services through gained efficiencies not currently possible using the legacy EHR system. An annual savings of $478,700 based in the implementation of the replacement EHR system is expected. A positive Return on Investment (ROI) will result in Year 2 of operations, assuming that the tangible benefits are realized as expected. The cost of not implementing a replacement EHR system was untenable (per the DOC’s Health Services Director), since the legacy EHR system (ERMA) would no longer be available as of February 1, 2016. As indicated above and in the body of this report, the acquisition cost for the replacement EHR system appears reasonable

Deliverable	Highlights from the Review
	(if not a bit below what is anticipated based on our assessment of similar agencies in other states) and should not be a barrier to implementation.
Impact Analysis on Net Operating Costs	The proposed EHR system is expected to have a positive impact on the Vermont DOC's Net Operating Cost after the second year of operation, based on the cost of upgrading and operating the legacy ERMA system versus the cost of implementing and operating the proposed EHR system. If tangible benefits identified by the DOC are considered, the positive impact on Net Operating costs is accelerated, occurring in the first year of operation.

1.3 Identified High Impact and/or High Probability of Occurrence Risks

Table ES.3 highlights risks identified in the Independent Review that would have a high impact if the risk should occur and/or a high probability of occurring. The State's planned risk response and BerryDunn's assessment of that response are also provided. There is a single risk that falls into this category; it has a high risk probability rating and a medium risk impact rating.

Table ES.3: High Impact Risks

#	Risk Description	State's Planned Risk Response	BerryDunn's Assessment of Planned Response
1	Centurion has not worked with subcontractors CorrecTek and Kalleo before.	*Please see the Risk Register in Appendix B for the State's planned risk responses and BerryDunn's associated assessment due to their length.*	

1.4 Other Key Issues and Risks

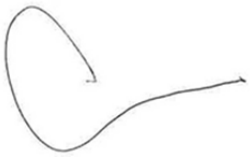
For the purposes of this report, an issue is defined as a situation which has occurred or will definitely occur, as opposed to a risk which is a potential event. No key issues have been identified regarding the proposed procurement.

1.5 Recommendations

Based on the risks identified during the development of this report and the risk mitigation approaches presented by the DOC, we recommend that the EHR system replacement project be approved, with the provision that all high impact and/or probability risks be mitigated prior to the execution of the contract.

1.6 Certification

BerryDunn has completed its Independent Review and believes it reflects an independent and unbiased assessment of the proposed vendor's solution acquisition cost, technical architecture, implementation plan, cost-benefit, and impact on net operating costs.



_____ 1/29/2015

Signature **Date**

2.0 SCOPE OF THE INDEPENDENT REVIEW

2.1 In Scope

In accordance with the Statement of Work (SOW) released on October 14, 2014, BerryDunn conducted an Independent Review to evaluate the Electronic Health Records system component of the Comprehensive Healthcare Services for Inmates project, which includes procurement and implementation of an EHR system by the Vermont Department of Corrections. The scope of this report fulfills the requirements of Vermont Statute, Title 3, Chapter 45, §2222(g):

The Secretary of Administration shall obtain independent expert review of any recommendation for any information technology initiated after July 1, 1996, as information technology activity is defined by subdivision (a)(10), when its total cost is $1,000,000 or greater or when required by the State Chief Information Officer.

The Independent Review report includes:

- An acquisition cost assessment
- A technology architecture review
- An implementation plan assessment (which includes a risk analysis)
- A cost analysis and model for benefit analysis
- An impact analysis on net operating costs for the Board

It is the intent of the State that the following items be performed or addressed by the BerryDunn through the SOW:

- Hold a Project Planning and Independent Review kickoff meeting with the primary goal of introducing the players and discussing the Independent Review process going forward.
- Review all pertinent materials, contracts, SOWs, project work plans, and other documentation necessary to establish an understanding of the project(s) and proposed work being reviewed.
- Hold approximately two days of on-site meetings at State offices in Vermont collecting information and interviewing stakeholders.
- Facilitate a teleconference call with the selected system vendor.
- Identify risks and catalogue them into a risk register.
- Facilitate a discussion of strategies to mitigate risks with the Oversight Project Manager (OPM), Project Sponsor, and stakeholders.
- Work with the various stakeholders to develop specific responses to each risk identified; develop specific plans/strategies and actions to address those risks (accept risk, mitigate risk, transfer risk, etc.).

- Work with OPM to ensure the Risk Response Plan is finalized with the Sponsor before final review with CIO.
- Conduct other meetings and collect other information as necessary.
- Create an Independent Review report according to the SOW, and deliver the draft document to the OPM.
- Hold an on-site meeting with the State Enterprise Project Management Office (EPMO) OPM, DII Deputy Commissioner, Sponsors, and State CIO to present the final review report and answer any questions.
- Update the final report incorporating feedback and submit the final report for CIO approval.
- Via the OPM, obtain CIO sign-off to signify the acceptance of the Independent Review deliverables at the conclusion of the Independent Review engagement.

2.2 Out of Scope

The scope of this independent review is limited to the assessment of the acquisition of the EHR system only, and does not include the Comprehensive Healthcare Services for Inmates program in its entirety.

2.3 Independent Review Limitations

This Independent Review of the DOC EHR System acquisition is limited to:

- Interviews and follow-up clarifying conversations with DII, DOC members and staff, and vendor representatives completed between November 3, 2014 and December 23, 2014 (see Table 3.1).
- Review of documentation provided to BerryDunn by the State (see Table 3.2).
- The duration of the Independent Review was limited to eight weeks, including fact-finding, writing the report and State review of the report
- BerryDunn leveraged what research materials were available at the time of the independent review (December 2014 to January 2015) as well we were limited by the scope of this project (with an estimated 16 hours of that time reserved for research activities).
- BerryDunn was limited to the knowledge of the Corrections industry of the individuals proposed on this project: Doug Rowe (10+ years of relevant experience) and Kate Lawrence (5+ years of relevant experience).

Additionally, it is limited by:

- Accuracy of the information provided in documents and by interviewees.

3.0 SOURCES OF INFORMATION

The two primary sources of information collected during the Independent Review process were interviews and project documents. Lists of individuals interviewed and documents reviewed by BerryDunn for this Independent Review are included in Sections 3.1 and 3.2, respectively.

3.1 Independent Review Participants

Several individuals were interviewed to gather information during this Independent Review. Table 3.1 provides details on who was interviewed, what agency/organization they represent, and the topic they were interviewed about during the Independent Review process.

Table 3.1: Independent Review Participants

Name	Agency	Participation Topic(s)	Date and Time of Interview
Nick Waringa, Chief Information Security Officer	Department of Information and Innovation (DII)	Security	November 19, 2014 1:00pm
Jack Green, Information Security Director, Agency of Human Services	DII	Security	November 19, 2014 1:00pm
Barbara Cormier	DII	Security, Centurion	November 19, 2014 1:00pm December 1, 2014 9:30am
Lucas Herring, IT Manager	Department of Corrections	Security, Centurion, Financials, Non-Financial, CorrecTek/Kalleo Review interim risk assessment questions Review VT EHR IR Risks	November 19, 2014 1:00pm December 1, 2014 9:30am December 1, 2014 1:30pm December 1, 2014 3:30pm December 2, 2014 8:00am December 4, 2014 1:00pm December 11, 2014 3:00pm December 19, 2014 1:00pm
Cheryl Burcham, Project Manager	Agency of Human Services	Security, Centurion, Financials, Non-financial, CorrecTek/Kalleo Review VT EHR IR Risks	November 19, 2014 1:00pm December 1, 2014 9:30am December 1, 2014 1:30pm December 1, 2014 3:30pm December 2, 2014 8:00am December 4, 2014 1:00pm December 19, 2014 1:00pm
Karl Kemp, Director and Implementation Coordinator	Centurion	Centurion, CorrecTek/Kalleo	December 1, 2014 9:30am December 4, 2014 1:00pm

Name	Agency	Participation Topic(s)	Date and Time of Interview
George Johns, Regional Vice President	Centurion	Centurion, CorrecTek/Kalleo	December 1, 2014 9:30am December 4, 2014 1:00pm
Keith Lueking, Director of Managed Care and Off-site Networks	Centurion	Centurion, CorrecTek/Kalleo	December 1, 2014 9:30am December 4, 2014 1:00pm
Christie Nader, Head of IT, Acting Project Manager	Centurion	Centurion, CorrecTek/Kalleo	December 1, 2014 9:30am December 4, 2014 1:00pm
John Campbell	Centurion	Centurion, CorrecTek/Kalleo	December 1, 2014 9:30am December 4, 2014 1:00pm
Dr. Dee Burroughs-Biron	Department of Corrections	Financials, Non-financial Review VT EHR IR Risks	December 1, 2014 1:30pm December 1, 2014 3:30pm December 2, 2014 8:00am December 19, 2014 1:00pm
Debra Kobus, Health Services Contract Monitor	Department of Corrections	Financials	December 1, 2014 1:30pm
Matt D'Agostino	Department of Corrections	Financials	December 1, 2014 1:30pm
Ben Watts, Research Associate	Community Oriented Correctional Health Services	Non-financial	December 1,2014 3:30pm December 2, 2014 8:00am
John Truitt	Kalleo	CorrecTek/Kalleo	December 4, 2014 1:00pm
Dan Jarrett, President	CorrecTek	CorrecTek/Kalleo	December 4, 2014 1:00pm
Jana Barnes, Chief Operating Officer	CorrecTek	CorrecTek/Kalleo	December 4, 2014 1:00pm
Ethan Gill	Centurion	CorrecTek/Kalleo	December 4, 2014 1:00pm

3.2 Independent Review Documentation

Several documents were assessed during this Independent Review including the State RFP and Centurion's proposal. Table 3.2 lists the documents provided to BerryDunn by the State for review during the Independent Review process.

Table 3.2: Independent Review Documentation

Document Name	Description	Source
2014 DOC Request for Proposal and Associated Documentation Folder	State RFP for Comprehensive Healthcare Services for Inmates and: Appendices 5.01 – 5.27 to the RFP, Attachments E, O, and P to the RFP, the Department of Corrections Policies and Procedures Manual, details of settlement agreements, FAQs, sample forms, statutes, and HS directives.	Department of Corrections SharePoint Site
Centurion of VT, Proposal	Centurion's proposal in response to the RFP.	Department of Corrections SharePoint Site
Centurion of VT, Attachments Binder	Attachments to Centurion's proposal in response to the RFP.	Department of Corrections SharePoint Site
Appendix 5 26 (b) – CorrecTek 11 12 14-1	Cost workbook from CorrecTek.	Department of Corrections SharePoint Site
Appendix 5 23 – Price Proposal PIPM Calculator to DOC 11 17	PIPM workbook from CorrecTek.	Department of Corrections SharePoint Site
Vermont DOC – Responses	Documentation on CorrecTek from Centurion.	Email from Dr. Dee Burroughs-Biron
CorrecTek Cloud Overview	Explanation of CorrecTek's cloud hosting.	Email from Dr. Dee Burroughs-Biron
CorrecTek – Data Migration Guide	Information on data migration using CorrecTek.	Email from Dr. Dee Burroughs-Biron
CorrecTek OMS Interface Guide	Documentation explaining CorrecTek's Offender Management System interface.	Email from Dr. Dee Burroughs-Biron
CorrecTek EHR Implementation Process	Explanation of the planned implementation process of CorrecTek.	Email from Dr. Dee Burroughs-Biron
CorrecTek 2014 Overview	PDF overview of CorrecTek with illustrative examples.	Email from Dr. Dee Burroughs-Biron via Lucas Herring.
Medical Services EHR Draft Contract 11 20 2014	Draft contract with Centurion.	Department of Corrections SharePoint Site

4.0 PROJECT INFORMATION

4.1 Historical Background

4.1.1 Vermont History

The DOC Health Services Division (HSDiv) is the division within the DOC that is responsible for the provision and oversight of a program of comprehensive and integrated health care services (otherwise referred to as health services) to inmates (pre and post adjudication) at all correctional facilities located throughout the State. The DOC provides inmate health services as guaranteed by the 8th and 14th Amendments to the United States Constitution. The Division also assists in oversight of health services for the DOC's out-of-state supplemental housing component, which is provided through a separate contract.

Relevant to this independent review, as part of the implementation of a new health services program, the DOC is soliciting bids from qualified vendors to implement a comprehensive electronic health records system (EHR) sufficient to meet the needs of the DOC. The EHR will ensure continuity of care before, during, and after an individual's period of incarceration and will meet the criteria for 2014 Meaningful Use.

4.1.2 DOC EHR System History

The Vermont Department of Corrections (DOC) currently uses a medical records program called ERMA (Electronic Record Management Application). After conducting interviews with administrative staff and users of the system, BerryDunn has learned that ERMA is primarily a system that accepts PDF files as attachments and has limited direct data input capabilities. ERMA also has a limited, one-directional interface with Maxor, the correctional pharmacy service. The DOC has never interfaced ERMA with Vermont Information Technology Leaders (VITL) Vermont Health Information Exchange (VHIE).

4.2 Project Goal

The DOC intends to achieve the following objectives through implementation of a comprehensive EHR System:

- Integrate physical, behavioral, pharmacy, dietary, and lab functionality into a single unified EHR solution with an interface to the OMS.
- Streamline and standardize workflow to increase quality of patient care and decrease errors.
- Support CQI, operational efficiency, and P4P programs made possible through data gathered through the system.
- Improve the coordination of care by enhancing interoperability among the Vermont DOC and external partners in care.
- Maximize the integration of behavioral health care.

- Attest to all Meaningful Use requirements.
- Attain interoperability with the VHIE through VITL.
- Automate report generation.
- Have 24x7x365 support and service.

4.3 Project Scope

The Department of Corrections looking to implement a comprehensive, full service health services system to provide a range of health services for inmates at its correctional facilities. Key to this health services program is an EHR sufficient to meet the needs of the DOC in providing care coordination, continuity, and linkages on behalf of inmates during incarceration as well as during all transitions of care, including but not limited to: interstate and intrastate transfers, reentry to the community, and re-admission to DOC.

The EHR will have the following minimal components:

- Capability of complying with 2014 Edition EHR Certification General Criteria (170.302).
- Drug-drug, drug-allergy interaction checks, including:
    - Notifications - Automatically and electronically generate and indicate in real-time, notifications at the point of care for drug-drug and drug-allergy contraindications based on medication list, medication allergy list, and computerized provider order entry (CPOE).
    - Adjustments - Provide certain users with the ability to adjust notifications provided for drug-drug and drug-allergy interaction checks.
- Capability of complying with 2014 EHR criteria for computerized provider order entry (CPOE) for the purpose of staff electronically recording, changing, and accessing pharmacy and pharmaceutical data.
- Maintain an up-to-date problem list.
- Maintain an active medication list.
- Maintain an active medication allergy list.
- Ensure that the health record will minimally include medical, dental, chemical dependency, and mental health information.
- An electronic inventory process to ensure the availability of daily stock medication and other necessary and commonly prescribed medications. The system shall be managed in such a manner as to ensure that costs are controlled and that the State is protected against the loss of pharmaceuticals through theft or other means.
- Ensure that the EHR meets requirements for computerized order entry for diagnostic services.

4.3.1 Major Deliverables

Section 1.6 of the RFP "Management Structure and General Information" outlines the project management and implementation requirements for the project, including:

- The contractor will provide a project manager who will follow the PMBOK methodology.
- The project manager will schedule and facilitate weekly project team status meetings.
- The contractor's project manager shall provide weekly written status reports to the State project manager. These weekly reports shall include: all tasks accomplished, incomplete or behind schedule in the previous week (as well as the reasons for any tasks that are behind schedule), all tasks planned for the coming two weeks, updated status of tasks (entered into the Project Plan and attached to the Status Report – % completed, resources assigned to task, etc.), and the status of any corrective actions undertaken. The report will also contain items such as the current status of the project's technical progress and contractual obligations, achievements to date, risk management activities, unresolved issues, requirements to resolve unresolved issues, action items, problems, installation and maintenance results, and significant changes to Contractor's organization or method of operation, to the project management team, or to the deliverable schedule where applicable.
- The contractor project manager will work with the State project team to finalize a detailed project work plan (in Microsoft Project). The selected contractor shall maintain and update the project plan on a regular basis (at least weekly, if not daily).
- The contractor will conduct a project kickoff meeting.
- The contractor shall provide a detailed Project Management Plan (PMP).
- The contractor shall produce weekly project status reports as defined above.
- The contractor shall keep an up-to-date project issues log.
- The contractor shall keep an up-to-date risk log.
- The contractor shall conduct weekly project team meetings, which shall include meeting agendas and meeting discussion log, action items, update issues, and risk logs accordingly.

4.4 Project Phases, Milestones, and Schedule

Section 1.7 of the State's RFP lists the procurement milestones for the healthcare services system. The implementation date is listed as unknown; however, the services start date is listed as February 1, 2015. The DOC reports their intent to begin the implementation of the EHR system on or about February 1, 2015 also, with a planned implementation go-live date of the end of November 2015.

5.0 ACQUISITION COST ASSESSMENT

Following is a summary of the costs associated with the proposed acquisition of an EHR system. This summary was developed through a review of information provided by the State and the costs described within CorrecTek's materials.

Table 5.1: Acquisition Cost Assessment

Acquisition Costs	Cost	Comments
Hardware Costs	**$19,000**	These are estimated by the DOC and are not provided by the vendor. Although the proposed EHR system is proposed as a SaaS implementation, the DOC reports that they anticipate needing to purchase local appliances and hardware components (e.g., bar-code scanners) that are not considered to be the responsibility of Centurion.
Software License Fee	**$142,546**	One-time fee
Implementation Services	**$253,650**	3,382 hours at $75/hour
System Interface Costs • OMS Interface • Pharmacy Interface • Lab Interface • Radiology Interface	**$44,500** $20,000 $12,500 $6,000 $6,000	Note that an interface to the State's VISION financial system is not a requirement of the DOC, and as such is not included in this list.
Travel	**$117,664**	Included in the firm fixed price for the acquisition and implementation of the EHR system.
Data Conversion	**$31,000**	Included in the firm fixed price for the acquisition and implementation of the EHR system.
Undetermined Interfaces	**$64,000**	512 hours at $125/hour (to support interfaces to VITL, EKG machine, MMIS, and others not currently defined)
Hosting Fee (during implementation)	**Up to $74,808**	This is a graduated fee based on a portion of the year the implementation used the Kalleo hosting service
Total Acquisition Costs	**$747,168**	(assumes the maximum hosting fee is required)

The draft contract between the VTDOC and Centurion, provided during this project includes all of the elements in Table 5.1, and associates them with specific deliverables. The contract cost for acquisition and implementation is a firm fixed price and includes hold-back for each deliverable to be paid upon successfully completion of the acquisition and implementation of the EHR system.

5.1 Cost Validation

Acquisition costs for the EHR system were sourced from CorrecTek's cost proposal. The BerryDunn Team then discussed these costs with the DOC project team to verify that they

understood the breakdown of the initial costs, including which were for licenses and which were for implementation.

5.2 Cost Comparison

The BerryDunn Team compared the license costs for the proposed CorrecTek EHR system with other states. The state most closely resembling the Average Daily Population of the State of Vermont offenders is the State of Maine, with an average of 2,000 inmates. A representative from the State of Maine was interviewed by BerryDunn. Although a specific “apples-to-apples” comparison cannot be made to the State of Vermont EHR system acquisition, the cost range is comparable. The value of the State of Maine EHR system licenses ranges from $278k - $285k; assuming a 20% annual Maintenance and Operations (M&O) fee, the value of annual M&O in Maine ranges approximately $55,600 to $57,000.

BerryDunn compared this to the costs for the proposed EHR system for the Vermont DOC, including the initial software license fee of $142,546 and annual M&O fees of $18,000. Based on this comparison, the State of Vermont seems to be acquiring the EHR system for at or below a comparable state. At an industry standard 20% of the initial license fee, one would expect the State of Vermont to pay approximately $29,000 annually for M&O (based on the $142,546 license fee).

In a larger jurisdiction, the license fees for an EHR ranged from $350k to close to $1m, with annual M&O fees ranging from $260k – $530k.

5.3 Cost Assessment

Based on the analysis provided in Section 5.2, the State of Vermont appears to be paying a license fee and ongoing M&O fees at or below those for a similarly-sized state. When the BerryDunn Team assessed the implementation costs, the item that seemed out of place was the number of hours and cost for the project management of the implementation. The DOC received clarification from CorrecTek and Centurion that the project management time and costs for the EHR system implementation are included (i.e., embedded) within the project management costs for the implementation of the health services contract as a whole, and it was difficult to extrapolate the project management costs attributable to the implementation of the EHR system independently. However, in general it appears that the costs of implementation are in line, if not lower than expected for an implementation of this size and complexity. As indicated in the Risks Matrix in Appendix B, this presents a possible risk if the vendor exceeds their expected effort for the implementation. In this circumstance, the vendor may ask the State for additional funding to complete the implementation. The DOC has begun working with the vendor on a mitigation strategy to minimize the likelihood of this occurring.

6.0 TECHNOLOGY ARCHITECTURE REVIEW

6.1 Alignment with the State's IT Strategic Plan

The State's IT Strategic Plan for 2014 – 2019 states that the six key principles DII uses to design and prioritize work are as follows:

1. Leverage successes of others, learning best practices from outside Vermont.
2. Leverage shared services and cloud-based IT, taking advantage of IT economies of scale.
3. Adapt the Vermont workforce to the evolving needs of state government.
4. Leverage modern IT delivery frameworks and enterprise architectures.
5. Couple IT with business process optimization to improve overall productivity and customer service, not just IT itself.
6. Optimize IT investments via Enterprise Architecture and Project Management methodologies.

The five major goals that guide DII are as follows:

1. Modernize critical IT
2. Ensure IT service sustainability
3. Operate effectively and efficiently.
4. Use IT for statewide productivity.
5. Create new solutions partnering with State Agencies.

In addition, the Strategic Plan identifies increasing the use of private cloud services as part of its goal to ensure sustainability of the State's information services and Software-as-a-Service (SaaS) as part of the goal to operate IT effectively and efficiently. The proposed solution supports the State's IT Strategic Plan Goal of operating effectively and efficiently by increasing the use of Software-as-a-Service (SaaS) since the EHR system is hosted by a third party (Kalleo).

6.2 Service Level(s)

The DOC reports that they are including standard service level language in the contract, including the following:

- The system shall have 99.98% uptime except as outlined in the Service Levels and Support section.
- Contractor warrants the Software shall perform in accordance with the Contract for a period of one (1) year commencing on the Go-Live Date. The State agrees to notify Contractor in writing of the error of the Software to satisfy the foregoing warranty and,

after verification thereof by Contractor, Contractor shall correct any reported error in accordance with the Service Levels.

- A contract section labeled (Section C. Service Level and Support)
- The service levels include a remedy section that describes the refund due to the VTDOC if specific service levels are not attained

6.3 Sustainability

The proposed EHR system, CorrecTek, has been in business since 2006, and purports to focus primarily on the healthcare submarket within the Justice and Public Safety market (e.g., corrections, jails, prisons). They invest in marketing at industry trade shows such as the American Jail Association, regional sheriffs' associations, the American Corrections Association, and the National Commission on Correctional Health Care. They list 13 customers on the press release page of their website (since October 2013). The proposed solution is 2014 "Meaningful Use" compliant (which was a requirement of the DOC), and is considered one of the mature systems in the EHR market (particularly focused on correctional healthcare). The DOC reports having multiple discussions with CorrecTek and conducting research prior to and during the procurement process, and reported that they feel comfortable with the technology and the company.

6.4 License Model

CorrecTek's software will be on a perpetual license. The State of Vermont is working to ensure that the contract specifies that the EHR system software license is transferrable to the State from Centurion, at the State's request or upon specific conditions. However, as of the publication of this independent review there was no evidence that such an agreement is in place. Because of this BerryDunn has developed a risk related to the lack of such observable language. This risk is included in the Risk Matrix provided in Appendix B.

Annual Maintenance and Operations fees will be paid to Centurion (who will pay them to CorrecTek).

The EHR system will be hosted by a CorrecTek hosting partner, Kalleo. Annual hosting fees have been provided in the CorrecTek proposal, and include a maximum 5% annual increase tied specifically to the usage of additional storage (i.e., the price increases proportionally to the amount of additional storage consumed, or does not increase if additional storage is not consumed).

Based on the draft contract with Centurion, provided by the VTDOC, it is our understanding that license fees, maintenance and support fees, and hosting fees will be paid by VTDOC to Centurion, who will in turn pay the appropriate fees to CorrecTek and Kalleo. Service Level Agreements (SLAs), including remedies for failure to comply with the SLAs, documented in the contract between Centurion and VTDOC will be replicated within contracts between Centurion and CorrecTek and Kalleo respectively. Centurion will hold CorrecTek and Kalleo responsible

for attaining the agreed-upon SLAs. Should the SLAs not be met, VTDOC will be compensated by Centurion according to the remedies described in the contract.

6.5 Security

Based on an interview the DII Security Team, they report that there seems to be no issues with the proposed EHR security model. The model used to access and secure data on the replacement EHR system is similar to that recently implemented for the DOC's new Offender Management System. The draft EHR contract with Centurion (provided to BerryDunn on December 9, 2014) includes several security-related requirements that seem to align with industry best practices. These include:

- Conducting an annual third-party security audit
- Requiring the contractor to provide the State with its Security Policy for its hosting environment for approval by the State
- Conformance with NIST, HIPAA and HITECH federal and state security statutes and policies

Based on our analysis of the draft EHR contract, the State of Vermont IT Strategic Plan for 2014 – 2019, and federal and state statutes, the appropriate security controls will be instituted for the replacement EHR system. BerryDunn recommends that the contract between Centurion and VTDOC clearly define the VTDOC as the owner of the data managed within the CorrecTek system and held at the Kalleo hosting facility. The contract should include a requirement that the security audits comply with NIST standards, including NIST SP800-53 Rev 4. With this language in place, the VTDOC will have access to audit results, regardless of the contracting vehicle with the services providers.

6.6 Disaster Recovery

The DOC is including language in the contract with Centurion (including CorrecTek and Kalleo) that meets or exceeds the Disaster Recovery standards required by DII, including Recovery Time Objective (RTO) standards, testing of the failover process prior to go-live and annual testing of the failover process.

The draft EHR contract with Centurion (provided to BerryDunn on December 9, 2014) includes several disaster recovery-related requirements that seem to align with industry best practices. These include:

- Requiring the contractor to provide the State with its Disaster Recovery Plan for its hosting environment for approval by the State
- The RTO as stated in the draft EHR contract is two (2) hours; the RTO published by DII for a "hot DR, 100% virtual") is four (4) hours.
- The RPO as stated in the draft EHR contract is 15 minutes for a normal outage and 24 hours for a catastrophic event.

The disaster recovery controls for the hosted EHR system also support the State of Vermont IT Strategic Plan for 2014 – 2019 in the following area:

- Goal: Ensure IT Service Sustainability; Implement generic Disaster Recovery capabilities for business critical systems

BerryDunn has developed a risk related to the lack of an observable failover test plan. This risk is included in the Risk Matrix provided in Appendix B.

6.7 Data Retention

The DOC has reported that they will be following current State of Vermont data retention statutes and has included a data retention requirement in the draft EHR contract with Centurion (provided to BerryDunn on December 9, 2014) that reads: “Data shall be entered into the contractor’s EHR in accordance with AHS and Vermont’s statutes on use of electronic health records and destruction or retention of paper originals.” This statement seems to align with the State of Vermont policy, published on October 1, 2008 and entitled “Records Management Best Practices for all Public Agencies.” Alignment with this policy, which includes references to State statutes, seems appropriate and sufficient for the new EHR system.

6.8 System Integration

The draft EHR contract with Centurion (provided to BerryDunn on December 9, 2014) includes a requirement that CorrecTek EHR will interface with several State IT systems, including:

- VITL: Vermont Information Technology Leaders/Vermont Health Exchange
- OMS: Offender Management System
- Pharmacy
- Lab
- Radiology
- EKG machine
- MMIS: Medicaid Medicare Information System
- VHIE: Vermont Health Information Exchange

The draft contract includes a statement that reads ”Any additional Data Interface requests shall be subject to a Change Order process.” This includes but is not limited to an interface to the VISION system, which is currently not within the scope of this project and is not a requirement as reported by the DOC.

7.0 ASSESSMENT OF IMPLEMENTATION PLAN

7.1 Implementation Readiness

7.1.1 Implementation Timeline

As of the time of the independent review, a contract for EHR services has not been signed and implementation has not yet begun. During an interview on December 4, 2014, CorrecTek stated that implementation will take from nine to 15 months, with their average implementation taking around 12 months.

The DOC's current EHR system, ERMA, will not be available after February 1, 2016. Assuming that the contract is signed in January 2015, there will be a 12-month window for implementation of the new EHR system. There is a risk that if anything goes wrong with implementation, or if there are any unanticipated delays, the new EHR may not be operational by the time of the legacy EHR expiration date.

CorrecTek has stated that they believe implementation could be possible in as little as six months, provided that everything goes according to plan. CorrecTek has also said that cooperation of all of the parties involved is key to an efficient implementation. To help ensure that the February 1, 2016 deadline is met, CorrecTek has reported that they will consider going live with essential functions initially and migrating legacy data further along in the process.

Subsequently, the DOC reported that they are negotiating a 10-month implementation period with CorrecTek and are development plans to increase the likelihood that a 10-month implementation is feasible. These include, but are not limited to:

- Pre-planning the key interface between the Offender Management System (OMS) and the EHR system.
- Pre-planning data migration activities for legacy ERMA data to be transferred to the new EHR system.
- Ensuring that appropriate staff is in place to manage, implement, test, and train on the new EHR system.

Based on our experience, the duration of the implementation of an EHR system with the scope of the one proposed by Centurion could span 12-18 months. Due to the constraints described above, the vendor is proposing to accelerate this to conclude the implementation within 10 months. The acceleration of a project such as this must be managed closely and includes inherent risks. BerryDunn has developed a risk related to the implementation timeline. This risk is included in the Risk Matrix provided in Appendix B.

7.1.2 Training

CorrecTek has provided a document titled “CorrecTek EHR Implementation Process,” which includes some details on training. CorrecTek will provide the DOC with a sample training schedule, which can be modified to meet the needs of the different facilities. According to CorrecTek, most nurses should anticipate requiring eight hours of training, while other users may only need four.

CorrecTek provides a team of trainers for “classroom style” training for all end users. The system will go live at the end of the training. The CorrecTek team will remain on-site for a period of 37 days to provide assistance, direction, and encouragement. Additionally, the DOC is negotiating with CorrecTek to ensure that all training materials are made available to the DOC in MSWord format to enable DOC personnel to update them to accommodate the unique VTDOC business rules and processes.

According to CorrecTek, chart prep is vital to the success of the EHR implementation. Chart prep involves making sure that critical inmate data is entered into the CorrecTek EHR database. CorrecTek will train DOC staff to do this task and states that it can be completed in two weeks depending upon the availability of State resources. The number of State resources that can be devoted to implementation, and the time that they can be committed for may greatly impact the efficiency of implementation.

Although it is typical for a vendor to provide a detailed training plan subsequent to contract execution, based on our observations the vendor’s proposed approach to training involves a measure of risk that, if not mitigated, could adversely impact the implementation and adoption of the replacement EHR system. BerryDunn has developed a risk related to the vendor’s proposed training approach. This risk is included in the Risk Matrix provided in Appendix B.

7.1.3 Department/Division Participation Readiness

The DOC has indicated that a majority of the current CCS employees are expected to be employed by Centurion during the transition of inmate health services from CCS to Centurion. Staff has experience with the legacy EHR system (ERMA).

All State stakeholders interviewed for the Independent Review expressed acceptance and readiness to transition to a new EHR system. It was also communicated that clinical staff find the current system difficult to use and look forward to the implementation of the new EHR. However, the State did express that they have limited resources to devote to the implementation.

The number of State resources needed to support the implementation of the EHR system is unknown. One of the primary reasons that the originally proposed EHR system, Medunison, was not chosen was due to their need for a large number of State resources for the implementation. The State of Vermont has indicated that they cannot assign multiple resources to the implementation of the new EHR system, and will rely on CorrecTek to execute the majority of the implementation tasks. BerryDunn has developed a risk related to the impact on

the EHR system implementation project if adequate resources are not available. This risk is included in the Risk Matrix provided in Appendix B.

If Centurion and CorrecTek are operating under the assumption that multiple State resources will be utilized during implementation, the project may result in delays.

7.1.4 Design, Conversion, and Implementation Plans

The DOC has reported that they are negotiating with CorrecTek to conduct project planning and fit-gap analysis immediately upon contract execution. CorrecTek has provided some project documentation regarding their typical configuration, implementation, data migration, and interface development strategies. Additionally, the DOC reports that they are working with CorrecTek prior to contract execution on the design of some of these elements in a proactive manner.

As of the writing of this report, there is no observable evidence that supports a detailed and comprehensive plan that:

- Based on the oncome of the fit-gap analysis, a 10-month implementation period is sufficient.
- Data cleansing and migration (mapping) is sufficient and will result in “clean” data being accurately migrated to the replacement EHR system.
- Development of system interfaces will be developed within the planned 10-month implementation period.

BerryDunn has developed multiple risks related to the implementation timeline, data migration and system interfaces. This risk is included in the Risk Matrix provided in Appendix B.

7.1.5 Support for Conversion/Implementation Activities

Please see Section 7.1.4.

7.1.6 Agency and Partner Staff Resources

Although the DOC has indicated that the availability of technical staff is limited, they are already planning for the collaboration with business staff (e.g., Centurion health services staff) to actively participate in the configuration, testing, and training for the new EHR system. The proposed EHR system is to be hosted off-site, and requires little or no technical staff for installation and configuration.

Please see Section 7.1.3 for additional narrative regarding BerryDunn’s concerns about resources.

7.1.6.1 State EPMO Oversight Project Manager

The assigned State EPMO Oversight Project Manager has recent experience overseeing system implementation projects for the DOC (e.g., the new OMS system), is familiar with the needs of the DOC staff, and understands the project artifacts required for large system implementations in that environment. She has been involved with this Independent Review. Based on our observation of the proposed EPMO Oversight PM, her experience with the DOC and the scope of the EHR replacement project, BerryDunn believes that this resource is adequate; no risk has been developed regarding the EPMO Oversight PM.

7.1.6.2 State Implementation Project Manager and Project Team

The State Implementation Project Manager has significant experience implementing large enterprise-level systems within the DOC. She recently was involved in the implementation of the new Offender Management System (OMS) and will be transitioning from that implementation project to the EHR system implementation project during the first quarter of 2015. The OMS system implementation and EHR system implementation are not expected to overlap significantly.

Based on our observation of the proposed State Implementation PM and DOC Project Team, their experience with the DOC, and the scope of the EHR replacement project, BerryDunn believes that these resources are adequately skilled to manage this project. However, the availability of the State Implementation PM may involve some measure of risk, as she is currently managing the end of the DOC Offender Management System implementation project. Should this project overlap significantly with the EHR implementation project, her availability may not be sufficient. The timeline for both projects suggests that this will not be realized and that she will be able to seamlessly shift from the OMS project to the EHR project. No specific risk has been developed regarding the State Implementation PM; however, a risk has been developed that indicates that DOC resources may not be adequate in general (please see Appendix B).

7.1.6.3 Centurion / CorrecTek Program and Project Management Team

During interviews with Centurion, CorrecTek, and the State, it became clear that a Centurion Project Manager will provide primary oversight to the implementation of the EHR system. They have reported that this resource will oversee CorrecTek resources for all phases of the implementation, including fit-gap analysis, installation, configuration, testing, training, go-live, and post go-live activities. Although this resource has no experience with the implementation of the CorrecTek system specifically, she does have EHR implementation experience. Additionally, Centurion and CorrecTek reported that CorrecTek staff will play a significant role in the implementation phases. The most significant weakness in the implementation plan and team approach is in the area of testing (please see Section 7.1.7).

Because the proposed Centurion PM has not previously managed the implementation of the CorrecTek EHR product, BerryDunn has developed a risk related to this fact. This risk is included in the Risk Matrix provided in Appendix B.

7.1.7 Adequacy of Testing Plan/Approach

The proposed approach to validating that the implemented EHR system meets the State's requirements initially did not seem adequate. The reported approach was to conduct up to three "road shows" or demonstrations of the configured system to key stakeholders, enabling stakeholders to ask questions and challenge the configuration decisions, but not to actually "touch a keyboard" and actively participate in the testing process. BerryDunn feels like this approach may result in the risk that a system may be implemented at go-live that does not meet the State's requirements.

Through discussions with the DOC project team members, they reported that they will be requiring CorrecTek to train key resources during this implementation phase. These key resources (likely health services practitioners from multiple disciplines throughout the organization) will develop and execute test scripts, with the goal of testing all requirements that result from the fit-gap analysis and approved system configuration deliverables. This approach is likely to result in a reduction in the impact of this risk.

7.1.8 General Acceptance/Readiness of Staff

As indicated in the Risk Register provided in Appendix B, the health services staff will undergo two distinct changes during a 12-month period of time: change in management as they transition from CCS to Centurion employees, and changes incurred by transitioning from the legacy EHR system to the CorrecTek system. The DOC Health Services Director reports that, because of the lack efficiency inherent with the legacy EHR system, many staff members have reported that they are excited about using a new, more modern EHR system. Additionally, she reports that she expected the productivity decrease associated with the transition from CCS to Centurion.

7.2 Risk Assessment and Risk Register

7.2.1 Approach

The Risk Assessment and Register is a key component of this Independent Review of the EHR system replacement. For the purposes of the review, a risk was defined as an uncertain event or condition which, if it occurs, could have a negative effect on successful completion of the project's objectives. Risks are events or conditions that may occur in the future.

BerryDunn identified risks related to the following topic areas during interviews review of documents for this Independent Review:

- General
- Acquisition Costs
- Technical Architecture
- Implementation Plan
- Cost-Benefit Analysis
- Impact on Net Operating Costs

Attributes of each identified risk were then assessed, including:

- Risk description
- Impact and probability rating
- Timing of risk response
- Impact description

After assessment of each risk, BerryDunn developed and met with the Vermont DOC Health Services Director and EHR project staff to review recommended risk strategies and responses. Following the meeting, the Director and staff documented their planned strategies and responses to each risk, incorporating their knowledge and experience into them. Finally, BerryDunn assessed if, based on the team's judgment, the State's planned risk response appeared appropriate and adequate. Many Risk Impact and Probability rankings were adjusted from the initial submission of identified risks to the VTDOC based on the DOC's documented risk mitigation strategies. The State's risk responses are documented verbatim in the Risk Register in Appendix B, as is BerryDunn's assessment of those responses.

7.2.2 Risk Register Definitions

Table 7.1 defines the elements of the Risk Register provided in Appendix B.

Table 7.1: Risk Register Element Definitions

Data Element	Description
Risk #	Sequential number assigned to each risk to be used when referring to the risk.
Risk Source	Source of the risk, which may be the Project, Proposed Solution, Vendor, or Other.
Risk Description	Brief narrative description of the identified risk.
Risk Impact / Probability	Two-value indicator of the potential impact of the risk if it were to occur, along with an indicator of the probability of the risk occurring. Assigned values are High, Medium, or Low. If a Risk is determined to have a current and ongoing impact on the project, the Impact value will be set to "100%." By definition, challenges that are having current and ongoing impacts to the project and are 100% probable, are issues; however ,for simplicity's sake we are managing both in the same register.
Timing of Risk Response	Planned timing for carrying out the risk response, which may be Prior to Contract Execution or Subsequent to Contract Execution.
Risk Impact Description	Narrative description of the potential impact of the risk.
State's Planned Risk Strategy	Strategy the State plans to take to address the risk. Assigned values are Avoid, Mitigate, Transfer, or Accept.
State's Planned	Risk response the State plans to adopt based on discussions between State

Data Element	Description
Risk Response	staff and BerryDunn reviewers.
BerryDunn's Assessment of State's Planned Response	Indication of whether or not BerryDunn reviewers feel the planned response is adequate and appropriate, and recommendations if not.

7.2.3 Risk Prioritization and Summary

This section includes two risk scatter diagrams indicating the relative priority of risks based on their potential impact and probability. The risk scatter diagrams also indicate which risks should be addressed ***Before Contract Execution*** and those that may be addressed ***Subsequent to Contract Execution***. The risks are positioned on each diagram to enable the user to quickly determine the level of risk impact, as well as the probability of each risk occurring.

The table following the risk scatter diagrams summarizes all identified risks included in the complete Risk Register in Appendix B. Risks in Table 7.2 and Appendix B are presented in descending order, with impact as the primary factor and probability as the secondary factor. For example, a risk assigned high impact/medium probability would be ranked before a risk assigned low impact/high probability but after a risk assigned high impact/high probability.

		Probability		
		High	**Medium**	**Low**
Impact	**High**			
	Medium	R1	R2, R3, R4, R5,	R6, R7, R8, R9, R10, R11, R12, R13
	Low			R15, R16, R17, R18, R19, R20, R21, R22

Risk Scatter Diagram 7.1: Before Contract Execution

		Probability		
		High	**Medium**	**Low**
Impact	**High**			
	Medium		R5, R6	R12, R14
	Low			

Risk Scatter Diagram 7.2: Subsequent to Contract Execution

Table 7.2: Risk Summary

Risk #	Risk Description	Category	Risk Impact / Probability	Recommended Risk Response Timing
R1	Centurion has not worked with subcontractors CorrecTek and Kalleo before.	General	Medium/ High	Before contract execution
R2	If the EHR system is not deployed by the February 1, 2016 deadline, the State will lose access to their legacy data.	Implementation Plan	Medium/ Medium	Before contract execution
R3	The deployment of the EHR may be delayed due to lack of resources.	Implementation Plan	Medium/ Medium	Before contract execution
R4	Insufficient testing may encumber go-live and cause unanticipated errors.	Implementation Plan	Medium/ Medium	Before contract execution
R5	The DOC may see more than one decrease in staff productivity.	Implementation Plan	Medium/ Medium	Before and after contract execution
R6	System failover of the EHR may not be successful.	Technical Architecture	Medium/ Low	Before and after contract execution
R7	Implementation services may cost more than anticipated.	Implementation Plan	Medium/ Low	Before contract execution
R8	The State may not receive needed maintenance and support for the new EHR.	Implementation Plan	Medium/ Low	Before contract execution
R9	Inaccurate or insufficient interfaces with external and internal systems.	Implementation Plan	Medium/ Low	Before contract execution
R10	Inadequate training for State staff on EHR system.	Implementation Plan	Medium/ Low	Before contract execution
R11	Ownership of the EHR software.	General	Medium/ Low	Before contract execution
R12	The new EHR system may not function optimally without cleansing of legacy data.	Implementation Plan	Medium/ Low	Before and after contract execution

Risk #	Risk Description	Category	Risk Impact / Probability	Recommended Risk Response Timing
R13	Overpayment of hosting fees over time.	Implementation Plan	Medium/ Low	Before contract execution
R14	Deployment of the EHR system may take longer than anticipated.	Implementation Plan	Medium/Low	After contract execution
R15	The procurement process was not conducive to EHR vendors submitting individual proposals.	General	Low/Low	Before contract execution
R16	The EHR system may not be deployed or supported as efficiently as it could be.	Implementation Plan	Low/Low	Before contract execution
R17	Confusion regarding the annual payment schedule and support fees.	Implementation Plan	Low/Low	Before contract execution
R18	The deadline for the interface between the EHR system and the OMS may not be met.	Implementation Plan	Low/Low	Before contract execution
R19	Adequate application support may not be available post go-live.	Implementation Plan	Low/Low	Before contract execution
R20	CorrecTek and JailTracker may not successfully interface.	Technical Architecture	Low/Low	Before contract execution
R21	Twenty-four hour support may not be available for go-live of the EHR system.	Implementation Plan	Low/Low	Before contract execution
R22	Performance degradation may occur without a data warehouse for reporting.	Technical Architecture	Low/Low	Before contract execution
R23	The State may end up overpaying for hosting during deployment.	Implementation Plan	Low/Low	Before contract execution

8.0 COST-BENEFIT ANALYSIS

8.1 Analysis Description

The Vermont DOC did not have a specific Cost-Benefit Analysis (CBA) of the implementation of an EHR system at the beginning of this analysis; instead, their CBA was for the health services as a whole (which includes the EHR system). Because of this, BerryDunn was unable to compare a CBA with one developed by the State. As a result, BerryDunn collaborated with the DOC to develop a CBA that provides the State with a report of all costs (one-time and ongoing) compared with the tangible and intangible benefits associated with the implementation of the EHR system.

To conduct the cost-benefit analysis, all known costs were inventoried. Non-recurring (i.e., upfront implementation) and recurring (i.e., ongoing operational, hosting) costs for transitioning to the new system and vendor were collected from CorrecTek's cost proposal, reviewed by the BerryDunn team, and validated with the Vermont DOC project team members.

Benefits were gathered by the Department of Corrections clinical, administrative, and information technology staff, and were shared with BerryDunn. They were then compared with benefits espoused as best practices and are aligned with BerryDunn's experience with other EHR system implementations. HealthIT.GOV describes the following benefits associated with the implementation of an EHR system:

- Improve quality and convenience of patient care
- Increase patient participation in their care
- Improve accuracy of diagnoses and health outcomes
- Improve care coordination
- Increase practice efficiencies and cost savings

These are aligned and may be cross-walked with the assumptions listed in Section 8.2 below.

8.2 Assumptions

The following assumptions were developed collaboratively between the Vermont DOC and BerryDunn for the cost-benefit analysis. These assumptions are shared by the State and BerryDunn and seem appropriate based on our experience with EHR implementations in other states.

- The State will not incur any addition hardware, software, or implementation costs, other than those listed in the cost table.
- Nurse time pay is, on average, $25.00 per hour for Licensed Practical Nurses (LPNs) and $28.00 per hour for Registered Nurses (RNs), with a $2.00 and $3.00 differential for evening and night shift respectively.

- Licensed Nursing Assistant (LNA) pay is approximately $15.00 per hour.
- Clerical pay is $13-15 per hour.
- Mental Health Practitioner (MHP) pay is $24-32 per hour.
- Clerical support and LNA spend 60 minutes at seven facilities scanning documents into ERMA each day. This will be reduced to 30 minutes with the new EHR.
- Nurses spend, on average, 12 minutes per day at eight facilities dealing with pharmacy-related medical grievance research and resolution. This time will be reduced to six minutes with the new EGR.
- Nurses spend, on average, 25 minutes per day at six sites updating medication inventory. This process will be reduced to taking 12 minutes per day with the new EHR.
- Returning medication to the pharmacy is currently a manual process and takes nurses 20 minutes per day at six facilities. The new EHR will automate that process and reduce the time to ten minutes per day.
- LNAs spend 30 minutes per day at six facilities handling record requests for incoming inmates. This time will drop to 15 minutes per day with the introduction of a dynamic form that can be automatically populated.
- Clerical support staff spends an average of 40 minutes per day at six facilities for over eight providers scheduling and tracking appointments. This process will be automated and reduced to 20 minutes per day.
- Nurses spend 60 minutes per intake exam and conduct approximately six exams per day at six different facilities. Dynamic forms will automatically set follow-up appointments and tasks and will reduce this time to 30 minutes.
- In-state transfers of inmates is a multi-step, manual process that currently requires 20 minutes per inmate at each facility and occurs on average 12 times per day. The new EHR will automate this process and reduce the time nurses spend with in-state transfers to 20 minutes per day.
- Out-of-state transfers of inmates are multi-person processes. Currently, all steps are manual and nurses spend on average 90 minutes per transfer and about 42 hours per month on out-of-state inmate transfers. The new EHR will automatically populate forms and reduce this time to 45 minutes per transfer.
- The current process for each medication order and transcription involves multiple nursing staff checks prior to being transmitted to the pharmacy. These checks take place over and involve nursing staff on all three shifts. With the implementation of the new EHR system the provider will write and enter his/her own order and transmit it to pharmacy directly, eliminating the three checks and saving time and money. The pharmacy processes approximately 60,000 prescriptions per year.

8.3 Costs and Funding

The DOC reports that funding for the new EHR will come from the State of Vermont's General Fund.

8.4 Benefits

Benefits associated with the acquisition and implementation of the proposed EHR system were provided by the State and categorized as tangible and intangible. Tangible benefits may be quantifiable, where a savings dollar value can be associated with the benefit, or they may be non-quantifiable but still material and physical. Intangible benefits are those that cannot be associated with specific dollar savings and may not have a material or physical impact but are important considerations for the replacement of the system. The benefits depicted in Table 7.3 below resulted from the assumptions developed by the DOC and BerryDunn and represent a reasonable set of tangible benefits that should be expected by the DOC on an annual basis, starting with the first year after the implementation of the EHR system. BerryDunn validated the preliminary benefits provided by the DOC against benefits realized by other EHR implementations and against industry best practices, and believes that they represent a reasonable set of benefits. The DOC reports that they expect no immediate impact of these benefits on the annual operational budget in the short term, although operations and business processes will be continually evaluated to determine if staff reduction through attrition in the future may be considered.

8.4.1 Tangible Benefits

Table 7.3: Agency Reported Tangible Benefits

Tangible Benefits	Expected Benefit
Elimination of the need to continuously scan documents into ERMA	$13,650
Pharmacy-related medication research and resolution	$10,400
Automation of medication inventory	$7,800
Automation of medication returns to pharmacy	$6,500
Automation of stock medication inventory	$6,500
Automation of records request for incoming inmate	$5,800
Automation of appointment scheduling and tracking	$15,600
Automatic scheduling of appointments during intake	$117,000
Automation of in-state transfers of inmates	$26,000
Automatic population of forms for out-of-state inmate transfer	$9,450
Automation of medication order and transcription multi checks	$260,000
Total one-time Savings	**$478,700**

8.4.2 Intangible Benefits

All benefits listed by the DOC in Table 7.3 were considered to be tangible. The primary intangible benefit is related to the timeframe in which the legacy EHR system will be available, and the need to replace it with a new EHR system before February 1, 2016. After this date, the legacy EHR system will no longer be available for use; should a new EHR system not be identified and implemented by this date, health services staff will need to rely on manual business processes and paper documentation.

8.5 Costs versus Benefits

The five-year total cost of ownership for the EHR system is expected to be $1.2m. An annual tangible benefit total, as reported by the DOC, is expected to be $478,700. Reporting this benefit in a straight line across all contract years results in a positive ROI in Year 2.

8.6 IT ABC Form Review

The IT ABC Form did not break out the costs and benefits associated with the implementation of a modern EHR system from the inmate health services costs and benefits. Because of this, the BerryDunn Team was unable to assess the IT ABC form anticipated EHR system costs versus the proposed costs and benefits for the CorrecTek EHR system.

9.0 IMPACT ON NET OPERATING COSTS

9.1 Overview

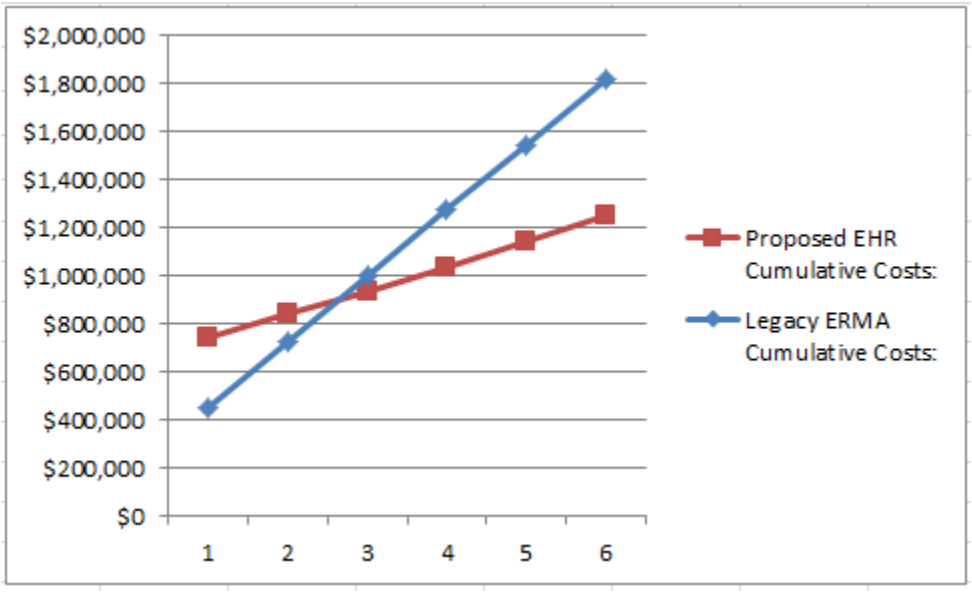
The proposed EHR system is expected to have a positive impact on the Vermont DOC's Net Operating Cost after the second year of operation based solely on the cost of upgrading and operating the legacy ERMA system versus the cost of implementing and operating the proposed EHR system. The chart below reflects this impact. If tangible benefits, identified by the DOC are considered, the positive impact on Net Operating costs is accelerated, occurring in the first year of operation.

This conclusion was drawn by comparing the cost information for the proposed EHR system (see Appendix C) with the cost information provided by the Vermont DOC regarding the ongoing operation of the legacy ERMA system. The cost data provided for the ongoing operation of the legacy ERMA system was provided by the incumbent health services provider – CCS. The cost information provided in Appendix C was provided in the Centurion proposal.

Table 9.1: Impact on Net Operating Costs

Estimated Costs	Initial Cost - Implementation Year	Operational Year 1	Operational Year 2	Operational Year 3	Operational Year 4	Operational Year 5	Six-Year Totals
Upgrade Legacy ERMA System							
Equipment	$212,909	$0	$0	$0	$0	$0	**$212,909**
Travel	$70,000	$0	$0	$0	$0	$0	**$70,000**
Time and Materials	$168,000	$0	$0	$0	$0	$0	**$168,000**
Ongoing Operational Costs							
Annual Licensing Fee		$120,000	$120,000	$120,000	$120,000	$120,000	**$600,000**
Application Maintenance and Support	$0	$120,000	$120,000	$120,000	$120,000	$120,000	**$600,000**
Training	$0	$34,000	$34,000	$34,000	$34,000	$34,000	**$170,000**
Total ERMA Costs:	**$450,909**	**$274,000**	**$274,000**	**$274,000**	**$274,000**	**$274,000**	**$1,820,909**
Legacy ERMA Cumulative Costs:	**$450,909**	**$724,909**	**$998,909**	**$1,272,909**	**$1,546,909**	**$1,820,909**	
Proposed EHR Cumulative Costs:	**$747,168**	**$839,976**	**$936,524**	**$1,037,000**	**$1,141,600**	**$1,250,530**	
Net Impact on Operating Costs	-$296,259	-$115,067	**$62,385**	**$235,909**	**$405,309**	**$570,379**	

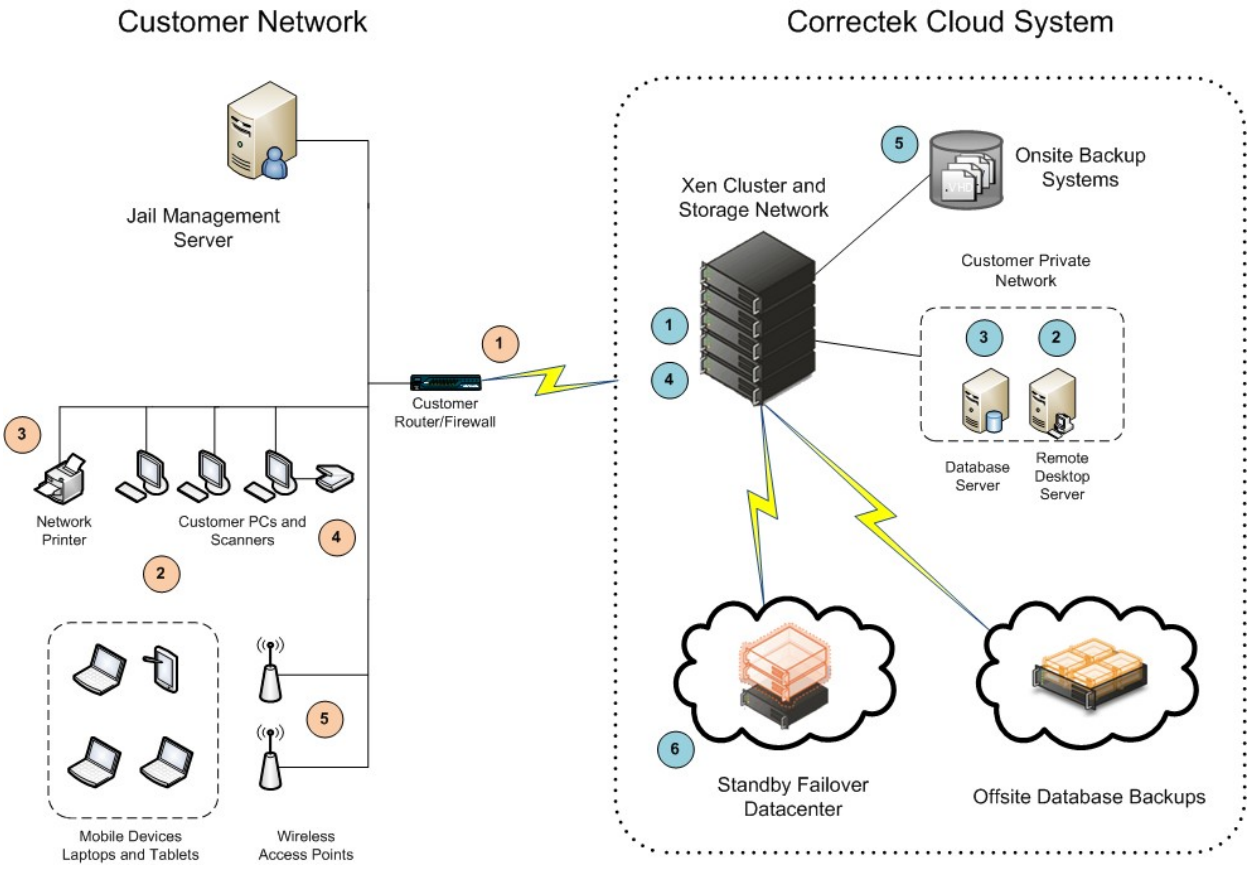
Exhibit 9.1 – Cumulative Operational Cost Comparison over 6 years



9.2 Federal Funding

The Vermont DOC reports that no federal funding will be used to fund the implementation and ongoing operation of the proposed EHR system, nor is federal funding currently used to fund the ongoing operation of the legacy ERMA system. They report that the funding source to support the proposed EHR system will be the DOC operational budget.

APPENDIX A – ILLUSTRATION OF SYSTEM INTEGRATION



APPENDIX B – RISK REGISTER

Risk #: R1	Risk: Implementation and deployment of the EHR system may not be effectively managed by Centurion.	Risk Impact/Probability: Medium/High
Risk Description:	Centurion has never used or deployed CorrecTek as an EHR system provider or used Kalleo as a hosting provider. Additionally, the CorrecTek EHR system has not been deployed at a third-party hosting facility that is not managed by Kalleo (NOTE: CorrecTek has been deployed on premises at some customer sites.)	
Risk Impact Description:	Centurion will be working in a system implementation role for a system that they have never implemented before. CorrecTek will be primarily in charge of data migration and system deployment, but there is a risk that Centurion may not be able to effectively manage and implement a system that they have not worked with before. Inefficiencies in communication and lack of experience could lead to a delay in the deployment of the EHR system. Additionally, should the State or Centurion not be satisfied with Kalleo as a third-party hosting facility, migrating CorrecTek to an alternate hosting facility involves risk.	
Recommended Risk Response Timing:	Before contract execution.	
State's Planned Risk Strategy:	DOC will have a Project Manager assigned (Cheryl Burcham) to oversee the project. There will also be a Project Manager from CorrecTek, a Project Manager from Kalleo, and Christine Nader as the Project Manager from Centurion to oversee the entire implementation. Centurion will also utilize a Centene resource that has implemented CorrecTek previously and will be used on this project.	
State's Planned Risk Response:	Although the system has not been deployed outside of Kalleo, CorrecTek has successfully deployed using this group and is known as a leader in this industry. Centurion has also implemented EHR systems as part of their current business strategy. Centene currently employs a resource that has implemented CorrecTek previously and will be used on this project. For Centurion, this is a similar oversight function regardless of what the EHR solution would be.	

Risk #: R1	Risk: Implementation and deployment of the EHR system may not be effectively managed by Centurion.	Risk Impact/Probability: Medium/High
BerryDunn's Assessment of State's Planned Response:	The State has acknowledged that by asking Centurion to work with CorrecTek, a company that they have never worked with before, that they are adding a risk to the project. Consequently, the State has developed a mitigation strategy to address this prior to contract negotiation through the provisioning of project management resources and techniques. Ensuring that devoted project managers are in place, as well as having a State resource devoted to project management, seems a reasonable risk mitigation technique. Additionally, we recommend that the State consider including contract language that enables them (or Centurion) to change hosting services providers for cause or if agreement on future hosting fees cannot be attained.	

Risk #: R2	Risk: The State may have a period with no EHR system and without access to their legacy data.	Risk Impact/Probability: Medium/Medium

Risk Description:	The ability to access the legacy EHR system, Electronic Record Management application (ERMA), expires on February 1, 2016 and the CorrecTek EHR system must be implemented prior to that deadline. It is unclear when the implementation of the CorrecTek EHR system will begin, as the contract process for this system is not complete, nor is there a specific date for completion. CorrecTek indicated that an implementation timeline may range from nine months to 15 months, depending on the level of configuration and customization required and the complexity of the implementation. At this time these variables are unknown. When asked, CorrecTek indicated that they may be able to accelerate the implementation process to as few as six months; however, the average implementation timeline is 12 months.
Risk Impact Description:	The EHR system contract has not yet been signed and likely will not be until late January 2015 at the earliest. Any further delay in execution of the contract may result in increased risk in implementation by the February 2016 deadline. Failure to implement the new EHR system by February 1, 2016 will lead to the DOC being unable to access their legacy data via the ERMA application (although a flat-file extract of the legacy data is expected to be made available). Based on estimated timing of the contract execution, the best case scenario is a 12-month implementation period for the CorrecTek EHR system. Any delay in contract execution will reduce this timeframe.
Recommended Risk Response Timing:	Before contract execution.
State's Planned Risk Strategy:	The State is addressing the risk needs as quickly as possible in order to present an overall strategy to DII for approval. DOC will utilize e-Silanis for contract routing for a quicker contract signing period. Contract drafting is in concurrence with this process to save time to contract signing. DOC has already spoken with Centurion and CorrecTek about processes that will take the longest to implement; data conversion meetings are requested with the current vendor to work on the migration needs and all parties are in agreement that several interface creations can occur after go-live if needed. DOC operations can still continue using paper forms if ERMA is not replaced by February 2016, but all parties agree that this is unlikely.
State's Planned Risk Response:	It is agreed that there is a short timeline to implement, but a strategy has been discussed to push go-live to November 2015. The CorrecTek solution requires very little configuration and creation of the interface to the OMS is the only one that all parties agree needs to be in place prior to go live, allowing the groups to focus on data conversion and those conversations are already beginning. The November timeline would also allow time for medical staff to still view the legacy data in ERMA for a period of up to three months to ensure that the system is working correctly post go-live and allow for the other interfaces to be developed later in the timeline.

Risk #: R2	Risk: The State may have a period with no EHR system and without access to their legacy data.	Risk Impact/Probability: Medium/Medium
BerryDunn's Assessment of State's Planned Response:	The three mitigation strategies described by the State appear reasonable (accelerating the contract execution; accelerating the implementation timeline; determining core functions that must be available at go-live and those that can be delayed until post go-live). Additionally, the State indicated that the CCS IT Manager will remain on staff as a Centurion employee after the transition and that they are already discussing interface options with the vendor. However, given CorrecTek's statement that a typical implementation time is 12 months, and the earliest the contract will be signed is the end of January, that leaves an implementation timeline of 10 months (unless the planned project end date is extended) and a shorter project duration can increase project risk. We recommend that, in addition to indicating that some interfaces can be delayed until post go-live, CorrecTek document the specific techniques that will be employed to support the accelerated 10-month timeline, including project controls to ensure that the shortened timeline is achievable and is being measured closely during the implementation.	

Risk #: R3	Risk: Deployment of the EHR system may be delayed due to lack of resources.	Risk Impact/Probability: Medium/Medium

Risk Description:	The number of State resources needed to support the implementation of the EHR system is unknown. One of the primary reasons that the originally proposed EHR system, Medunison, was not chosen was due to their need for a large number of State resources for the implementation. The State of Vermont has indicated that they cannot assign multiple resources to the implementation of the new EHR system, and will rely on CorrecTek to execute the majority of the implementation tasks.
Risk Impact Description:	If Centurion and CorrecTek are operating under the assumption that multiple State resources will be utilized during implementation, the project may result in delays (see Risk #2).
Recommended Risk Response Timing:	Before contract execution.
State's Planned Risk Strategy:	DOC Medical Services has 5 staff, which would not change in any implementation. AHS-IT will be assisting with items as necessary, including a Project Manager and two (2) DOC liaison staff. Staff SME resources for data conversion, security, network, hardware, interface creation, and other areas will be requested as needed from AHS-IT, DII, and from DOC partners. There is a list of assigned staff resources for project from Centurion including the Quality Assurance Director, and 1.5 FTE clerical staff. Additionally, the 80%+ CCS staff that will transition to becoming Centurion staff having working knowledge of ERMA can be assigned as necessary to assist in the testing strategy and to be assigned as power users of the system to support other staff in the transition.
State's Planned Risk Response:	Centurion agrees with the State that there are a number of Centurion staff that will be made available for this project. Although the medical service providers are not State staff, they are users of the system and will be assisting in the process to implement the CorrecTek solution.
BerryDunn's Assessment of State's Planned Response:	The State's mitigation strategy appears to be reasonable; however, BerryDunn recommends additional measures to ensure that sufficient staff will be available for the implementation of the EHR system. Current CCS staff that will remain but become employees of Centurion will provide additional resources for implementation. During a discussion with the DOC, Dr. Burroughs-Biron indicated that she believes that the percentage of CCS staff remaining on staff with Centurion is close to 90% or greater. However, the State may want to do some more formal surveying of the CCS staff (if possible) to determine whether or not the retention rate that they are anticipating is likely to occur. Additionally, the State may want to determine the impact of taking current CCS staff (future Centurion staff) offline to participate in EHR implementation activities. We further recommend that, although Centurion has indicated that "there is a number of Centurion staff that will be made available for this project," this staff will be made available at no additional charge to the State.

Risk #: R4	Risk: Go-live of the new system may not go smoothly and unanticipated errors may occur due to insufficient testing.	Risk Impact/Probability: Medium/Medium

Risk Description:	A traditional user acceptance testing (UAT) process is not planned for State signoff prior to production deployment of the EHR system. CorrecTek described their standard process for customer signoff on the configuration of the EHR system prior to production deployment. Their standard process does not involve the development of test scripts, the identification of State resources to conduct UAT activities, State resources executing test scripts (and reporting results) and final formal signoff that the test scripts have been successfully executed (to the satisfaction of the State). The standard CorrecTek process for State pre-production approval includes a series of demonstrations (typically three total demonstrations) to key State staff, followed by the State's approval for production deployment.
Risk Impact Description:	Although CorrecTek described this process as standard and effective in other implementations, the risk that all State-required configurations are not tested during this process is high, possibly resulting in a production system that does not satisfy the State's requirements.
Recommended Risk Response Timing:	Before contract execution.
State's Planned Risk Strategy:	The State DOC Quality Assurance position will be assigned as the Project Lead for testing. CorrecTek is willing to set up web based training for a power user group (Admin user group to be decided on that includes the 5 DOC staff plus Centurion IT Manager, Nursing Staff and the Medical Director), in order to understand the system prior to "show and tell" sessions and to gather and maintain feedback from staff during configuration. CorrecTek is providing a list of current users from other states and counties that can speak on how the implementation strategy has worked for those implementations. For oversight of this process, DOC is also instituting a Steering Committee of 4 staff, including three Medical Service staff and a DOC financial staff resource to receive recommendations and address any implementation issues that occur.
State's Planned Risk Response:	The CorrecTek approach is more agile and allows for less need of resources and time. DOC is acceptable to this process and will ensure that reference checks are performed demonstrating this strategy was successful in other implementations. Centurion medical service provider staff is available to test the system along with the 5 DOC staff and to provide feedback in the "show and tell sessions" to ensure that all contract requirements of the system are met.

Risk #: R4	Risk: Go-live of the new system may not go smoothly and unanticipated errors may occur due to insufficient testing.	Risk Impact/Probability: Medium/Medium
BerryDunn's Assessment of State's Planned Response:	Diligently checking references from other implementations of CorrecTek is an excellent way to begin mitigating this risk. This, in combination with the State's request for a web-based training for power users prior to the "show and tell" of the system, appears to be a reasonable initial risk mitigation strategy. Additionally, the DOC has indicated that Centurion staff, in collaboration with the QA resource, will be developing scripts that will test configuration requirements and will be used to inform approval of the system. However, these strategies do not address how the State will be assured that their requirements (stemming from a Fit/Gap analysis phase, conducted early in the project) are all met prior to go-live. Although the testing model seems to align with an "agile" methodology, it may not result in full testing of all system configuration and testing elements to assure that the system is ready for go-live. We highly recommend that a comprehensive testing plan (including the development and execution of test scripts by Centurion personnel under DOC QA leadership) be conducted prior to the DOC signing off on the system. Additionally, the State should reserve the right to execute the signoff and not delegate this important gate to Centurion.	

Risk #: R5	Risk: Multiple decreases in DOC and Centurion staff productivity are likely.	Risk Impact/Probability: Medium/Medium
Risk Description:	Staff productivity may decrease twice during the 12-month period between the implementation of the health services contract (February 1, 2015) and the implementation of the EHR system (targeted for February 1, 2016 or earlier). Lost productivity is likely during the change of administration (from CCS to Centurion) and again when the new EHR system is implemented.	
Risk Impact Description:	Productivity decreasing twice in 12 months may lead to increased inefficiencies and increased costs as practitioners learn the new administration's business processes, policies, and procedures, and the new EHR system. This may negatively impact the number of patients seen and the time spent with patients within the first 12-15 months of the Centurion contract.	
Recommended Risk Response Timing:	Both before and after contract execution.	
State's Planned Risk Strategy:	The State DOC intends to use the current policies and procedures in the ERMA system will the new implementation of the CorrecTek solution, adjusting as necessary with added system functionality. For the initial transition to new Centurion management, 80%+ of the medical service provider and support staff will be the same and the staff will still be utilizing the same system (ERMA). For transition to the new system, training will be provided to all staff utilizing the new system. Centurion IT staff will maintain accounts and permission levels established as is currently done with CCS staff in ERMA. The CorrecTek system has greater functionality and will enable the staff to perform and document more than previous.	
State's Planned Risk Response:	It is noted that there will be a transition period and that services may decrease slightly. This would be true for transition any new system, which is the only option in order to continue operations. Centurion is minimizing the severity of the inefficiencies when they come into management as they are employing a majority of the same staff and utilizing the current system in place. The experience gained in working with the Vermont DOC will aid in understanding policies and procedures in order to perform a smoother transition into the CorrecTek solution. Spreading the change in management and the change into a new system into two different periods will also allow minimize the dip in services that could occur. Additionally, not having an EHR at all will permanently impact productivity therefore a potential reduction at two points should not be a significant factor.	

Risk #: R5	Risk: Multiple decreases in DOC and Centurion staff productivity are likely.	Risk Impact/Probability: Medium/Medium
BerryDunn's Assessment of State's Planned Response:	The State acknowledges that the implementation of any new system brings with it a period of adjusting. The State anticipates minimal disruption during the transition from CCS to Centurion, as much of the staff will be the same. During this period, the staff will continue to use the current EHR system. BerryDunn agrees with the Agency's response to this risk and encourages the State to make sure that the anticipated 80% retention rate is accurate. The plan to continue the use of ERMA for a period appears to be a reasonable mitigation response to this risk.	

Risk #: R6	Risk: System fail-over of the EHR system may not be successful.	Risk Impact/Probability: Medium/Low
Risk Description:	There is currently no planned system fail-over testing strategy built into CorrecTek/Kalleo's hosting plan.	
Risk Impact Description:	Without a fail-over an annual testing approach for the strategy, it is unknown if the EHR system will successfully fail over to the alternate site in the event of a disaster. If a disaster occurs and the EHR system does not successfully fail over to the alternate site, the result could include a significant delay in accessing the EHR system.	
Recommended Risk Response Timing:	Before contract execution and after contract execution.	
State's Planned Risk Strategy:	The State has requested documentation that details the full disaster recovery plan. In initial conversations with CorrecTek and Kalleo, there is a 24 hours RPO, 4 hours RTO, which meets the State minimums for a catastrophic event and is acceptable to DOC. The State Project Manager also reviewed documentation on other State of Vermont EHR projects and similar disaster recovery information was provided for those solutions. It was also noted that within the hosting facility that the timeframes were much shorter; up to 10 minutes for RPO and 2 hours RTO.	
State's Planned Risk Response:	A disaster recovery plan is included as a deliverable in the contract that meets or exceeds the State's minimum requirement for RPO and RTO and the Contractor is agreeable to these terms.	
BerryDunn's Assessment of State's Planned Response:	Including the disaster recovery plan as a deliverable in the contract with Centurion seems like an adequate and appropriate response to this risk. Additionally, the DOC has indicated that testing of the disaster recovery plan will be an approval gate prior to system go-live and annually thereafter.	

Risk #: R7	Risk: The State may end up paying more than they anticipate for implementation services.	Risk Impact/Probability: Medium/Low

Risk Description:	It is unclear what portion of the $612,360 listed as “Packaged Software Costs” in CorrecTek document “Appendix 5 26(b)” is for the software license and how much of that is for implementation services.
Risk Impact Description:	CorrecTek’s cost proposal combines the software license fee and implementation fee. If the breakdown of license fees v. implementation fees is not clear, the State of Vermont may be assuming that all implementation services are included in this price when there could be additional costs. This could result in the State paying more than they had anticipated. The State may also not be clear on the scope of the implementation based on the true implementation costs, resulting in change requests for implementation services that may not be considered in scope by CorrecTek or Centurion. NOTE: Once the documentation regarding the professional services break-down is provided to the State and BerryDunn, we will include narrative in this risk regarding the appropriateness of the professional services funding for a 9-15 month implementation project and the risk associated with that level of funding.
Recommended Risk Response Timing:	Before contract execution.
State’s Planned Risk Strategy:	DOC has set up meetings with Centurion and CorrecTek to review the original cost workbook and follow up financial questions that detail the number of hours for each contract deliverable and cost for software license fees. Centurion is willing to meet with the State to discuss any of the financial items as needed.
State’s Planned Risk Response:	DOC reviewed the cost workbook provided by Centurion as was required in the RFP. The overall maximum cost of the contract was acceptable to DOC from the bid proposal. DOC will review these costs with Centurion to apply them correctly to different milestones within the contract to ensure that the scope, timeline and cost for services are maintained.
BerryDunn’s Assessment of State’s Planned Response:	The State plans to meet with Centurion to clarify the breakdown of software and implementation costs. CorrecTek has been asked at least twice to provide clarification regarding their costs. The State’s diligence at determining the exact breakdown of software versus implementation costs appears to be a reasonable mitigation response to this risk.

Risk #: R8	Risk: The State may not receive needed maintenance and support for the new EHR.	Risk Impact/Probability: Medium/Low

Risk Description:	CorrecTek document "Appendix 5 26(b)" lists a cost of $18,000 per year for years 3, 4, and 5 for a "Technical Support Representative." It is unclear what services are included for this maintenance and support fee, and this dollar amount seems low for comprehensive maintenance and support for a system for which license fees may range from $435,000 to $612,000 (also see Risk #9).
Risk Impact Description:	The State may be without essential maintenance and support, which could potentially lead to system interruption and down time or the vendor may request additional funding for "enhanced services" that may not be originally contemplated as part of maintenance and support. Additionally, approximately $80,000 annually is proposed for hosting the CorrecTek system. It is unclear what services are provided for this cost and/or if some of the typical "support" functions are provided through this fee instead of through the $18,000 maintenance and support fee attributed to the EHR system.
Recommended Risk Response Timing:	Before contract execution.
State's Planned Risk Strategy:	Technical support of the CorrecTek software: · Includes software updates distributed periodically in order to eliminate detected errors, improve performance, or broaden the functionality of the software. · Technical support is available via telephone 24 hours a day, 7 days a week, 365 days a year when the CORRECTEK technical support telephone number (1.866.438.3671, option 2) is utilized. · Technical support of the CorrecTek Software consists of consulting with respect to installation, troubleshooting, and use of the software. Hosting fees include the support and maintenance for Kalleo, including the costs associated with needed licenses.
State's Planned Risk Response:	DOC is acceptable to the level of support that is outlined from Centurion for CorrecTek and Kalleo.
BerryDunn's Assessment of State's Planned Response:	The State's additional research into the maintenance and support provided by CorrecTek and Kalleo and their deeper understanding of what support is available 24/7/365 appears to be a reasonable mitigation response to this risk.

Risk #: R9	Risk: Interface Control Documents (ICDs) have not been defined or agreed upon, which may result in inaccurate or insufficient interfaces with external and internal systems.	Risk Impact/Probability: Medium/Low

Risk Description:	CorrecTek has not yet defined the interface control documents for required interfaces with the EHR system, nor has CorrecTek agreed to produce these important deliverables during the implementation of the EHR system.
Risk Impact Description:	Without interface control documents, the possibility exists that inputs, outputs, and appropriate data transfer protocols may not be agreed upon and may result in an incorrect interface being developed and implemented. Additionally, the testing of the developed interface is more difficult when an ICD is not available for determining "what" the interface should do.
Recommended Risk Response Timing:	Before contract execution.
State's Planned Risk Strategy:	Although interface information was included as part of the bid response, the level and detail was not that seen in other DOC contracts for an interface control document (ICD). DOC provided Centurion an example of the ICD normally seen and Centurion will be providing information back to the State.
State's Planned Risk Response:	Additional information has been requested by the State and will be provided through Centurion.
BerryDunn's Assessment of State's Planned Response:	The State has provided an example of a typical Interface Control Document and has asked for Centurion to provide information to the State based on that documentation. This appears to be a reasonable response to this risk.

Risk #: R10	Risk: State staff may not be adequately trained on the CorrecTek system.	Risk Impact/Probability: Medium/Low

Risk Description:	CorrecTek indicated that the training materials used to train State staff on the CorrecTek EHR system are generic, and not customized to the unique configuration of the customer's CorrecTek implementation.
Risk Impact Description:	Confusion among training participants may be increased when using materials that do not accurately reflect the specific system that they are being trained on and will use to manage the electronic records of inmates for the State. Additionally, the training materials are typically used by users as reference guides after the training is conducted. If the manuals do not reflect specific screens, fields, workflow and other unique State configuration items, a decrease in productivity or an increase in help desk calls may result.
Recommended Risk Response Timing:	Before contract execution.
State's Planned Risk Strategy:	Although the training material given is generic, there are minimal configuration needs from DOC. Additionally, Centurion will provide the CorrecTek training materials in Word format to allow DOC to update screen shots on the documentation if they feel it is necessary. The training on the system would also take place on a copy of the State of Vermont configured system. The resource for the training is the same for each implementation and the process for each system release is the same.
State's Planned Risk Response:	Confusion would be alleviated with updated training documents as provided from DOC and with training on the State of Vermont configured system.
BerryDunn's Assessment of State's Planned Response:	The State has taken the additional step of getting CorrecTek training materials in Word format so that the DOC can update screen shots on the reference guide that will be used following training. Given that the State anticipates that there will be minimal configuration needs from the standard system for the DOC; this seems like a reasonable risk mitigation approach. We recommend that the DOC plan for a training resource to update and continue to manage the training materials in a repository. As the EHR system configuration evolves, there is a high likelihood that the training materials will become stale unless actively managed and updated. Additionally, we recommend that the State validate their assertion that minimal configuration of the EHR is required. This is typically not known until after the Fit/Gap analysis phase of the project.

Risk #: R11	Risk: Vermont may not own the license to the software and could lose access to the EHR system.	Risk Impact/Probability: Medium/Low
Risk Description:	The State of Vermont is not contracting directly with CorrecTek for their software license. Centurion is negotiating the contract with CorrecTek "on behalf of the State of Vermont, DOC." It is currently unclear if the State will be the true owner of the software license, or if Centurion is the owner of the license.	
Risk Impact Description:	If Centurion is the owner of the software license, the VTDOC may not have access to the system without additional cost in the event that the Centurion contract with VTDOC expires or is terminated.	
Recommended Risk Response Timing:	Before contract execution.	
State's Planned Risk Strategy:	Outline the transferal of the license to the State if the contract expires or is terminated.	
State's Planned Risk Response:	In discussions with Centurion, this is being addressed in the contract by outlining that the license is transferrable to the State of Vermont. The current contract process is to allow for Centurion to manage the system and that maintain the system responsibilities (user account creation, assigning permissions, etc.). If the contract is to expire or terminate, so will these responsibilities, which will all transfer to the State.	
BerryDunn's Assessment of State's Planned Response:	Explicitly addressing ownership of the CorrecTek software license in the contract seems like the best and most effective way to mitigate this risk. Therefore, this seems like a reasonable mitigation response to this risk.	

Risk #: R12	Risk: The new EHR system may not function optimally without cleansing of legacy data.	Risk Impact/Probability: Medium/Low

Risk Description:	The State has indicated that it does not have the resources to devote to cleansing legacy data prior or subsequent to migration to the new EHR system. A data cleansing strategy (to be executed before or after migration to the new EHR system) has not been developed.
Risk Impact Description:	Failure to cleanse legacy data may result in duplication of patients in the new system and lead to inefficiencies. The State may not experience the full value of the CorrecTek EHR system if it is implemented without cleansed data, or if data is not cleansed "as used" subsequent to migration to the CorrecTek EHR system.
Recommended Risk Response Timing:	Before and after contract execution.
State's Planned Risk Strategy:	In conjunction with migration of the legacy data, reports will be provided as part of the current migration strategy that the project lead will review and bring to the steering committee with recommendations to complete this task. All parties are willing to start meeting early in the project in this area to ensure that data is migrated correctly and the necessary cleaning is performed. CorrecTek stated that a resource will be provided to migrate data and that their process allows for the import of attached documentation to records as long as CCS can provide that information. The State DOC Project Manager is currently working with CorrecTek and Centurion staff to request demo of CCS system and setting conversion conversations.
State's Planned Risk Response:	The Centurion Project Manager will oversee this task and ensure proper resources are available. State DOC Quality Assurance Administrator is assigned as the Project Lead for this task and report data cleaning needs to the Steering Committee. Data Migration and Conversion will be listed as a deliverable in the contract.
BerryDunn's Assessment of State's Planned Response:	The State has put effort into ensuring that the new EHR will not be hampered by unclean data. It appears that the State has a good understanding of the importance of clean data to a correctly implemented EHR and that discussions of how to cleanse the legacy data will start soon. This risk mitigation strategy appears reasonable.

Risk #: R13	Risk: Over time, the State may end up paying more money for the same level of hosting services.	Risk Impact/Probability: Medium/Low
Risk Description:	The hosting fee listed in CorrecTek document “Appendix 5 26(b)” increases by 5% each year with no rationale or explanation for the increase. There is a risk is that the State of Vermont will pay more than they should for hosting.	
Risk Impact Description:	If the fee structure remains as is currently stated, the State of Vermont may end up paying an escalating amount for the same hosting services, while not receiving an increased level of service.	
Recommended Risk Response Timing:	Before contract execution.	
State’s Planned Risk Strategy:	During the demonstration of the system, it was noted that there are several areas of added document storage that DOC currently does not have using the ERMA system (i.e. attaching audio and video files). Although a flat line of service is typical, it is believed that the amount of needed storage will be increasing dramatically from the previous solution. MS licensing costs may also increase on an annual basis, and a 20 GB per device (user) flat fee, $1 per GB overage is what Kalleo uses as a model for billing. The amount in the bid was stated as an amount up to a 5% per year based on these costs.	
State’s Planned Risk Response:	The Hosting provisions in the contracted will be listed as a capped increase of up to 5% over the previous year, which will require a billing statement outlining the need for the increases in order to receive payment.	
BerryDunn’s Assessment of State’s Planned Response:	The State has requested and received a response from CorrecTek about the increasing hosting fees. The State is satisfied with CorrecTek’s explanation and will write a provision into the contract limiting the increase to 5% over the previous year. The risk mitigation strategy by the State appears to be reasonable.	

Risk #: R14	Risk: The deployment of the EHR system may take longer than anticipated.	Risk Impact/Probability: Medium/Low

Risk Description:	A comprehensive implementation plan has not been provided to the State of Vermont from CorrecTek. A three-page document entitled “CorrecTek EHR Implementation Process” is available, but is not comprehensive.
Risk Impact Description:	Without a comprehensive implementation plan, it is possible that the State and CorrecTek may not be aligned in terms of specific activities required to implement the EHR system, and the implementation timeline is not clear. These may result in delays in implementation, or the appropriate State staff not being available within the timeline required for implementation (e.g., for testing and training). (NOTE: This risk has a risk impact of medium and a risk probability of low since a fully comprehensive implementation plan is not expected until after contract execution. BerryDunn recommends that the development of this plan be one of the first activities after contract execution to increase the probability of a smooth and successful implementation.)
Recommended Risk Response Timing:	After contract execution.
State’s Planned Risk Strategy:	It is typical that a project plan is created after the contract is signed. The State would have delivery of the first draft of such document within the first weeks of the contract to being discussions on the timeline and the commitment.
State’s Planned Risk Response:	It is a contract deliverable to receive a Project Plan within the first weeks of contract execution. Centurion would detail the comprehensive implementation plan at that time.
BerryDunn’s Assessment of State’s Planned Response:	The State has written a contract deliverable regarding the project implementation plan and will get it within the first week of contract execution. The State has also been communicating with CorrecTek regarding priorities for implementation. Clear communication as well as a contracted deliverable for a project plan seems a reasonable approach for risk mitigation.

Risk #: R15	Risk: The procurement process used to select an EHR system was not conducive to EHR system vendors submitting proposals without aligning with a health services provider.	Risk Impact/Probability: Low/Low

Risk Description:	The procurement process used by the State of Vermont Department of Corrections to acquire an EHR system may have limited the number of responses received by EHR system vendors, since the RFP was for comprehensive health services (the largest component of the RFP) with a requirement to include an EHR system in the bids. Because of this, it is likely that EHR system vendors were not compelled to bid for the EHR system component of the RFP independent of the health services, and the VTDOC only received EHR system bids that were aligned with services vendors (three bids were received). The decision to split the health services contract into two contracts (one for services and one for an EHR system) was made after the proposals were received, as opposed to before the RFP was issued.
Risk Impact Description:	The State may end up paying more than is necessary for a state the size of Vermont. There may also be other EHR systems that are more mature and include more functionality that did not bid. This process may result in the VTDOC implementing an EHR system that is not the best fit for their environment. (NOTE: During interviews, the VTDOC was clear that they felt comfortable with the selection of CorrecTek as their EHR system, based on conversations held with external health services consultants, the requirement for the EHR system to be "meaningful use compliant," and their understanding of the EHR system market.)
Recommended Risk Response Timing:	Before contract execution.
State's Planned Risk Strategy:	DOC followed the state RFP process. The bids were then evaluated by both AHS-IT and DII staff and the CorrecTek system was indicated as being a system that met the DOC technical requirements. CorrecTek is to provide references for both Centurion and the State to follow up on for any outstanding questions. All vendors were able to partner with comprehensive health services providers in the procurement process. Preliminary research on other EHRs provided by both the State DOC Project Manager and through COCHS has indicated that the system is well known and utilized within the industry.
State's Planned Risk Response:	DOC followed standard state RFP processes in order to secure bids from vendors. The CorrecTek solution is well known in the industry and the system included in a bid that was 2014 Meaningful Use compliant.

BerryDunn's Assessment of State's Planned Response:	Researching CorrecTek, through references and other means seems like s a reasonable risk mitigation approach. The State should make sure that all references are contacted before the contract is signed, and that there opportunities for other EHR system vendors to challenge the decision to implement the CorrecTek EHR system are minimized.

Risk #: R16	Risk: The EHR system may not be deployed or supported as efficiently as it could be.	Risk Impact/Probability: Low/Low
Risk Description:	CorrecTek has not yet agreed to follow ISO and ITIL principles during the implementation and support of the EHR system.	
Risk Impact Description:	If ISO or ITIL best practices are not followed, the implementation and support of the EHR system may be less efficient than possible.	
Recommended Risk Response Timing:	Before contract execution.	
State's Planned Risk Strategy:	Centurion uses a proprietary system internally, which can be exported to word, excel and pdf. Although the system to document is not in a state format, the state only requires that documentation be provided in standard formats.	
State's Planned Risk Response:	It was not a requirement in the initial RFP for CorrecTek to follow ISO and ITIL. Centurion is to provide the project plan to the State DOC Project Manager in MS Project.	
BerryDunn's Assessment of State's Planned Response:	The fact that ISO or ITIL was not a requirement of the CorrecTek services satisfies the mitigation of this risk. However, we recommend that the State negotiate clear processes and service level agreements with CorrecTek for the provisioning of support services regarding the EHR system that may follow some of the tenants of these industry standard services guidelines.	

Risk #: R17	Risk: Confusion may exist regarding the annual payment schedule for the EHR system maintenance and support fees.	Risk Impact/Probability: Low/Low

Risk Description:	The anniversary date of the EHR system contract is unclear, since the EHR system contract will be signed after the contract with Centurion for health services. The probability exists that the EHR system contract will have a different anniversary date than the health services contract.
Risk Impact Description:	If the anniversary date of the EHR system is not clear, as well as separate and apart from the contract with Centurion for health services, the State of Vermont may end up paying for EHR system services that they are not yet receiving or the invoicing for these two contracts may be confusing.
Recommended Risk Response Timing:	Before contract execution.
State's Planned Risk Strategy:	The billing provisions for the EHR are separate than that of the health services contract. Provisions will be in place for prorated hosting, but full payment for the system will be delivered via milestones in the implementation and as defined by the go-live date. Although the original intent was to have a system that is planned to "go-live" at the one year anniversary of the medical services contract to keep the different pieces aligned, it is not necessary to do so as these are two different contracts and two different payments structures.
State's Planned Risk Response:	Invoicing for services for the two contracts is separate. There is an outline for the implementation and go-live date listed in the contract, which the project plan will be developed in accordance to.
BerryDunn's Assessment of State's Planned Response:	Ensuring that the billing for the EHR and the health services contract are separate is an adequate and appropriate response to the risk that the EHR will be billed according to the health services anniversary date.

Risk #:R18	Risk: The deadline for the EHR system and OMS interface may not be met.	Risk Impact/Probability: Low/Low

Risk Description:	Section 2.63 of the Health Services RFP requires that an interface between the EHR system and OMS be operational within 60 days ("The contractor shall be prepared to develop within one (1) month and implement ('go live') within 60 days an interface between the EMR and the OMS; this process shall at all times be in coordination with DOC IT and DII"); however, it is not clear what the 60-day deadline refers to. It is possible that this deadline was developed before an agreement was made with the incumbent health services vendor to extend the use of EHR system to February 1, 2016. If this is the case, this risk has a low probability and low impact (as designated in the header above).
Risk Impact Description:	The failure to have clearly defined deadlines in the contract may lead to confusion and missed deadlines. Failure to have this interface in place before the proper deadline will mean that information may not be shared between the systems. For example, intake information will not be automatically populated from the OMS to the EHR system and will have to be manually entered.
Recommended Risk Response Timing:	Before contract execution.
State's Planned Risk Strategy:	This provision for an interface at 60 days was already discussed to have later in the contract. This will be outlined in the Project Plan.
State's Planned Risk Response:	The State has removed the provision to have the OMS interface completed within 60 days from the contract. Although a significant amount of communication has already occurred around this interface, Centurion and CorrecTek have agreed with DOC that the interface does not need to be completed until 2 months prior to go-live.
Reviewer's Assessment of State's Planned Response:	The State's reconsideration and removal of this deadline, extending the timeline for the implementation of the OMS interface, means that this may no longer be a risk.

Risk #: R19	Risk: Adequate application support may not be available post go-live.	Risk Impact/Probability: Low/Low

Risk Description:	Centurion's (or CorrecTek's) support for the EHR system is likely to be required for a period of time post go-live. This period where an enhanced level of support will be required has not been determined.
Risk Impact Description:	The State may need enhanced support from CorrecTek and Kalleo for a period after the go-live process, but that support may not be available. The State may end up paying more for those services if they are not included in the original contract. In addition, there may be some delays in patient care and in updating patient charts if real-time support is not available.
Recommended Risk Response Timing:	Before contract execution.
State's Planned Risk Strategy:	As part of implementation efforts, the CorrecTek Project Manager will monitor all telephone support issues to ensure they are being resolved appropriately. Additionally, as part of the CorrecTek implementation process, CorrecTek representatives will visit each in the weeks following go-live to resolve any outstanding challenges and offer suggestions to greater maximize end-user efficiency. At any time after deployment, 24/7/365 telephone technical application support is available to all end users.
State's Planned Risk Response:	The State includes contract language for Post Go-live meetings, which is outlined in the State's Planned Risk Strategy.
BerryDunn's Assessment of State's Planned Response:	The State has clarified CorrecTek's availability post go-live and plans to include language in the contract requiring the post go-live meetings. This risk mitigation strategy appears to be reasonable.

Risk #: R20	Risk: CorrecTek and JailTracker may not successfully interface.	Risk Impact/Probability: Low/Low

Risk Description:	The State of Vermont Department of Corrections is currently implementing JailTracker as the Offender Management System (OMS). An interface between JailTracker and CorrecTek is a requirement of the RFP. CorrecTek has indicated that they have not historically interfaced with JailTracker, but has reviewed JailTracker information and required data to exchange and indicated that they see no challenges with doing so.
Risk Impact Description:	There is a chance that CorrecTek may discover unanticipated challenges during the development of the interface between CorrecTek and JailTracker, which may result in an implementation delay or the inability to exchange specific data required by the VTDOC.
Recommended Risk Response Timing:	Before contract execution.
State's Planned Risk Strategy:	The State already has a draft interface that is needed for Medical Services to use for billing as of February 1st, 2015. This file will be in the same exact format as is provided to CCS currently. Expansion on this interface will require DOC Medical Staff to state what fields will be required, which both the data dictionary from the OMS and from CorrecTek have already been made available. This process will utilize the GlobalScape SFTP site that is already in place to allow access for retrieval by authorized staff.
State's Planned Risk Response:	Draft documentation is already in place for interface creation between OMS and CorrecTek. Transition changes are already documented with both vendors. Centene currently employs a resource that has implemented CorrecTek previously and will be used on this project (if needed) and CorrecTek has worked with InterAct in the past.
BerryDunn's Assessment of State's Planned Response:	The State appears to have recognized the risk associated with interfacing CorrecTek and JailTracker. Their development of a draft interface, as well as a plan to use the data dictionary from the OMS and CorrecTek to expand the interface appears to be a reasonable risk mitigation response.

Risk #: R21	Risk: Twenty-four hour support may not be available for Go-Live of the EHR system.	Risk Impact/Probability: Low/Low

Risk Description:	The CorrecTek implementation process document states that, unless the sales agreement contains other accommodations, 24-hour coverage will not be available during go-live. It is not clear from documentation currently provided by CorrecTek whether or not Kalleo will be available 24-7 during go-live. The following is an excerpt from the CorrecTek Implementation Plan: "NOTE: Your facility purchased an allotted number of CorrecTek representatives to work onsite for a specific number of hours. Unless your sales agreement contains other accommodations, 24 hour coverage will NOT be provided. Even without 24 hour coverage, count on your CorrecTek team to work staggered shifts to ensure professional assistance is available to most of your users during this critical time."
Risk Impact Description:	Since correctional health care is a 24/7 service, it is possible that a practitioner will need to access the EHR system after hours during the go-live period. If support is needed and is not available during that time, there may be a delay in care or a need to document medical information by hand and manually enter it into the system at a later time.
Recommended Risk Response Timing:	Before contract execution.
State's Planned Risk Strategy:	CorrecTek representatives will be onsite to assist end-users during the initial go-live period between the hours of 7am to 11pm. Between the hours of 11pm and 7am, while no CorrecTek representatives are on site, telephone technical support is available to end users. Telephone technical support is available 24/7/365 during and after go-live. Kalleo 24/7 telephone technical support is also available.
State's Planned Risk Response:	The level of support is the same as provided for the current ERMA system. DOC is aware that there is an additional cost to procure resources above this level and does not see the need for a higher level of service at this time.
BerryDunn's Assessment of State's Planned Response:	The State's response to the risk appears to be a reasonable mitigation strategy. Additionally, the DOC has indicated that CorrecTek has committed to having on-site resources available for 37 days after system go-live to address post go-live concerns. However, the State may want to clarify who (CorrecTek or Kalleo) they should be calling for what type of support services before the first after-hours emergency occurs.

Risk #: R22	Risk: Performance degradation may occur without a data warehouse for reporting.	Risk Impact/Probability: Low/Low

Risk Description:	CorrecTek indicated that their standard implementation does not contemplate the use of a data warehouse or data mart for the execution of standard and ad hoc reports. Instead, all reports are executed using the production transaction CorrecTek database. CorrecTek indicated that running reports against the transaction database is a standard approach and that customers have not experienced performance degradation since the SQL server is designed to manage multiple threads of activity.
Risk Impact Description:	Although the database technology is designed to minimize or mitigate the risk of production degradation when large reports (or non-optimized ad hoc reports) are executed, it does not eliminate the risk that degradation of the production transaction database will occur. If degradation does occur, it is possible that clinicians using the CorrecTek application to service the health care needs of the State offenders may experience slow response times, possibly resulting in decreased productivity or reduction in their ability to adequately services these needs.
Recommended Risk Response Timing:	Before contract execution.
State's Planned Risk Strategy:	After discussion with the different parties, larger staff reports will be run during "down times" per DOC policy. Only the 5 DOC staff and Centurion Regional office will staff have access to perform ad-hoc reports and will receive training on this functionality and when the queries are to run. When discussing the ability of the ad-hoc report, it was found that the tool is placed on the front end of the application to pull from production database. This tool has no ability to tie tables together, no ability to access SQL in the front end and users must pick from list of predetermined options (can't type code), which alleviates the risk of creating loops. Further discussions have been scheduled with the AHS Data Services Director to see if there are any other risks to consider.
State's Planned Risk Response:	The definition of ad-hoc report may be over generalized for this risk. Ad-hoc queries are not to run on the transactional database per State policy, but reports defined with parameters are and have been allowed. Since SQL and other coding schemas are not required with the use of this tool, DOC does not believe this is a risk and has asked for review from other State resources to confirm.
BerryDunn's Assessment of State's Planned Response:	The State's research of this risk, and their commitment to reaching out to other State recourses to confirm their findings, is appears to be a reasonable mitigation response to this risk.

Risk #: R23	Risk: The State may end up overpaying for hosting during deployment.	Risk Impact/Probability: Low/Low

Risk Description:	A proration table for the annual hosting fee during the implementation phase of the EHR system is undefined. There is no statement in the contract that the hosting fee will be prorated during planning and before actual hosting has begun.
Risk Impact Description:	If the hosting fee is not prorated during the first year of the contract, the State may end up paying for services that it is not receiving.
Recommended Risk Response Timing:	Before contract execution.
State's Planned Risk Strategy:	After discussion with Kalleo, bills can be provided for the services that are used from the point that they are provided, which will be modified to start as the environment set up at the Kalleo hosting facility. Kalleo agrees that there should be a prorated amount for the implementation phase and will be willing to work with the State on language in the contract to provide those services. Kalleo doesn't bill until receiving database from CorrecTek and additional billing doesn't occur until after users have access to the system on a per user basis. Original prorated period can be billed monthly with a "true-up" at the end of the period. As mentioned previously, after year one, the hosting provisions in the contracted will be listed as a capped increase of up to 5% over the previous year, which will require a billing statement outlining the need for the increases in order to receive payment.
State's Planned Risk Response:	The contract will have a prorated section for hosting during the implementation phase.
BerryDunn's Assessment of State's Planned Response:	The State has had discussions with Kalleo regarding prorated hosting fees and plans to write a section on prorated hosting fees into the contract. Therefore, the State's mitigation strategy seems adequate and appropriate.

APPENDIX C – LIFECYCLE COST-BENEFIT ANALYSIS

Estimated Costs	Initial Cost - Implementation Year	Operational Year 1	Operational Year 2	Operational Year 3	Operational Year 4	Operational Year 5	Six-Year Totals
One-time Project Costs							
Hosting and Disaster Recovery Support (Until Full Deployment)	Up to $74,808	$0	$0	$0	$0	$0	Up to $74,808
License Fee	$142,546	$0	$0	$0	$0	$0	$142,546
Implementation (3,382 Hours x $75)	$253,650	$0	$0	$0	$0	$0	$253,650
OMS Interface	$20,000	$0	$0	$0	$0	$0	$20,000
Pharmacy Interface	$12,500	$0	$0	$0	$0	$0	$12,500
Lab Interface	$6,000	$0	$0	$0	$0	$0	$6,000
Radiology Interface	$6,000	$0	$0	$0	$0	$0	$6,000
Travel	$117,664	$0	$0	$0	$0	$0	$117,664
Hardware Costs	$19,000	$0	$0	$0	$0	$0	$19,000
Data Conversion	$31,000	$0	$0	$0	$0	$0	$31,000
512 additional development hours (x $125) for future/undetermined interfaces which might include VITL, EKG machine, and Medicare/Medicaid	$64,000	$0	$0	$0	$0	$0	$64,000
Ongoing Operational Costs							
Application Maintenance and Support	$0	$18,000	$18,000	$18,000	$18,000	$18,000	$90,000
Hosting After Full Deployment	$0	$74,808	$78,548	$82,476	$86,600	$90,930	$413,362
Total Annual Costs:	$747,168	$92,808	$96,548	$100,476	$104,600	$108,930	$1,250,530
Cumulative Costs:	$747,168	$839,976	$936,524	$1,037,000	$1,141,600	$1,250,530	

Estimated Benefits	Initial Cost - Implementation Year	Operational Year 1	Operational Year 2	Operational Year 3	Operational Year 4	Operational Year 5	Six-Year Totals
Tangible Benefits							
Elimination of the need to continuously scan documents into ERMA	$0	$13,650	$13,650	$13,650	$13,650	$13,650	$68,250
Pharmacy-related medication research and resolution	$0	$10,400	$10,400	$10,400	$10,400	$10,400	$52,000
Automation of medication inventory	$0	$7,800	$7,800	$7,800	$7,800	$7,800	$39,000
Automation of medication returns to pharmacy	$0	$6,500	$6,500	$6,500	$6,500	$6,500	$32,500
Automation of stock medication inventory	$0	$6,500	$6,500	$6,500	$6,500	$6,500	$32,500
Automation of records request for incoming inmate	$0	$5,800	$5,800	$5,800	$5,800	$5,800	$29,000
Automation of appointment scheduling and tracking	$0	$15,600	$15,600	$15,600	$15,600	$15,600	$78,000
Automatic scheduling of appointments during intake	$0	$117,000	$117,000	$117,000	$117,000	$117,000	$585,000
Automation of in-state transfers of inmates	$0	$26,000	$26,000	$26,000	$26,000	$26,000	$130,000
Automatic population of forms for out of state inmate transfer	$0	$9,450	$9,450	$9,450	$9,450	$9,450	$47,250
Automation of medication order and transcription multi checks	$0	$260,000	$260,000	$260,000	$260,000	$260,000	$1,300,000
Total Annual Savings:	$0	**$478,700**	**$478,700**	**$478,700**	**$478,700**	**$478,700**	**$2,393,500**
Cumulative Savings:	$0	**$478,700**	**$957,400**	**$1,436,100**	**$1,914,800**	**$2,393,500**	
Net Return on Investment		**-$361,276**	**$20,876**	**$399,100**	**$773,200**	**$1,142,970**	