Review #	Reco #	Description	Owner	Scheduled Close	Actual Close	Status	Response
	OPEN RECOMMENDATIONS FROM CDR						
JPLS-CDR	CDR R1	Clarify/prioritize the scope of work as soon as possible with an emphasis for making sure that we are aligned with new opportunity for unique capabilities in polymer processing.	B. Ocko	1-Feb-18	23-Jan-17	Closed	We have reached out to the processing community, specifically at NIST. We have sent out a letter of announcement seeking input from the community. We received a response from NIST that we should be able to accommodate chambers the size of large microwave ovens.
JPLS-CDR	CDR R2	Not all stated capabilities will be within reach for JPLS (e.g. excellent time resolution for matter far out-of-equilibrium).	B. Ocko	9-Nov-17	9-Nov-17	Closed	This is mostly an issue with detector capabilities and we are building the instrument in a way which is convenient for detector upgrades.
JPLS-CDR	CDR R3	In order to guide the decision and refine the design, input from a larger community would be desirable.	B. Ocko	9-Nov-17	9-Nov-17	Closed	We are engaging advisory input through visiting scientific exchanges, for which we are budgeted appropriately.
JPLS-CDR	CDR R4	Clarify the scope with respect to whether or not investments made in JPLS should be re-usable for a future buildout.	B. Ocko	12-Feb-18	12-Feb-18	Closed	We will make a better effort to clarify what components should be suitable for PLS at the PDR. This is a difficult task since there is no design for PLS and the scope of PLS may change based on the success and lessons learned at JPLS.
JPLS-CDR	CDR R5	Consider keeping the long translations compatible with a level floor that would be essential for large roll-in equipment (e.g. use flat marble 'tiles' or simply polished concrete floor for the air-pads, instead of bulky granite slabs that might turn out to be in the way down the road).	D. Bacescu	1-Feb-18	8-Dec-17	Closed	Due to the lack of available space behind the instrument we will permanently place in the hutch, this is not the best beamline for space to be set aside for roll-in equipment. Removing the granite to accommodate roll-in equipment would compromise the performance of the liquids instrument and this would not be desirable.
JPLS-CDR	CDR R6	Verify as soon as possible the performance of key components. Develop in parallel backup plans, such as sending components back to the manufacturer for measurements/refurbishment, equipping stages with encoders, get quotes/lead times for new components.	B. Ocko	1-Apr-18	12-Feb-18	Closed	We have engaged members of BNL Survey group to test various components of the chi stage. Measurements will be carried out by April 2018. If the specs cannot be met, we will consider reconditioning the equipment with Huber. Mitigation plans including, intensity or positional feedback using a Renishaw encoder, are being made. These plans were detailed in the PDR.
JPLS-CDR	CDR R7	Besides the necessity to achieve a performance that would make the endstation work, re-usability of new/upgraded equipment in a future buildout might guide the decision (e.g. can the Eulerian cradle be re-used for a double deflector stage? Will the canted buildout still use a single crystal deflector to increase beam separation, as in the CDR for 12ID?).	L. Berman	9-Nov-17	9-Nov-17	Closed	We are not in a position to decide what a full buildout would entail because no decisions have been made for PLS. We are reasonably confident that the major mechanical components requiring replacement for PLS are associated with the crystal deflector and we are building all-new components when needed to avoid an upgrade later.
JPLS-CDR	CDR R8	Consider adding some flexibility to move detectors relative to each other and a more flexibility between sample stage and detectors stage (as in the PLS design).	B. Ocko	1-Feb-18	8-Dec-17	Closed	This is a very good suggestion. The latest design allows for WAXS detector to be moved manually in relation to the SAXS.

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JPLS-CDR	CDR R9	Providing focusing at a single energy, e.g. with a stack of CRLs, might be the most cost-effective option to achieve some state-of-the-art capability and should be evaluated for 'day 1' implementation or later upgrade.	L. Berman	12-Feb-18	nn-mmm-17	Closed	This is a good idea and we are looking into this with Oleg and Maxim. Specifically, we will explore the use of 1D CRLs at the higher energies where it will be particularly useful for the liquid/liquid measurements. preliminary analysis shows that about 40 Be lenses are required with a 50 micron radisu. TShould also work at lower energies with fewer lenses. CRLs have been envisioned for the future PLS and thus the potential CRLs that are now under exploration for JPLS could have a PLS purpose later. Constrained distances involving the upstream mirrors, SSA, and JPLS instrument location impose constraints on how well focusing using CRLs could be implemented, based on preliminary modeling
JPLS-CDR	CDR R10	Check the science case for resolution requirements for SAXS, particular at higher energies and in case a very short sample-detector distance of ~1.5m is pursued.	B. Ocko	1-Feb-18	23-Jan-18	Closed	We have reached out to experts in the field to see how important this factor of two in the small angle q resolution is. The additional scientific benefit of placing the detector at 3m (vs. 1.5m) does not justify the technical difficulties and associated costs. The design to be presented at PDR may also accomodate a 2m distance without the complexity of a 3m placement.
JPLS-CDR	CDR R11	Look into alternatives for the Pilatus1M, considering future requirements and availability of other detectors (including CCD for WAXS, Eiger1M in the equipment pool,…).	B. Ocko	1-Jun-18	12-Feb-18	Closed	We continue to explore alternatives to our preferred detector and we would like to hold off purchasing some of the detectors until after technical commissioning. For the WAXS detector, we have a preference for the Pilatus1M since for the same number of pixels the angular range is twice that of the Eiger and the improved resolution of the Eiger can not be fully utilized. The existing budget does not contain funds for a SAXS detector however an Eiger 1M might be available from the equipment pool and we have an existing Pilatus 100k k that could be dedicated. These options were presented in the PDR presentation. Further, there is now the possibility of using a Pilatus 300K from CMS for processing measurements at JPLS. Details are addressed in a memo to Erik Johnson
JPLS-CDR	CDR R12	The schedule is tight and the date for the PDR appears to be unrealistic at this time; should be shifted to a later date.	C. Stebbins	9-Nov-17	9-Nov-17	Closed	The PDR will be shifted to be between Feb 2- 16, 2018 to accommodate a more complete design by the PDR.
JPLS-CDR	CDR R13	Include a plan to test equipment that will be re-used from APS/NSLS and a plan to refurbish/replace components as necessary.	B. Ocko	1-Apr-18	5-Feb-18	Closed	A plan is detailed in recommendation R6.
JPLS-CDR	CDR R14	Allow for some time between PDR and procurement of custom components, such as slides, ballscrews and granites.	C. Stebbins	9-Nov-17	9-Nov-17	Closed	We have adjusted the schedule to order these components as quickly as possible after the PDR. Specifically, we have scheduled 3 additional weeks after the PDR to prepare to procure these items.
JPLS-CDR	CDR R15	If the schedule is intended to be used for resource loading and planning, make sure that the dependencies of the individual activities are properly captured.	C. Stebbins	9-Nov-17	9-Nov-17	Closed	We have adjusted the schedule to reflect this.

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JPLS-CDR	CDR R16	Controls and computational complexity might not be fully understood at this point, keep controls group involved as the design progresses to allow for resource planning.	B. Ocko	12-Feb-18	12-Feb-18	Closed	We are consulting with the controls group to reassess and refine the requirements. A dedicated presentation on controls was included in the PDR.
JPLS-CDR	CDR R17	If there is no other source of contingency, consider purchasing the 'nice to have, but not essential' items later than currently envisioned in the schedule, after some risks, such as performance of old equipment and uncertainties about the design, are retired. Such items are: fluorescence detector [available in the equipment pool; with 30% of user time for JPLS and assuming 50% of GUPs needs this detector -> ~6 weeks/year]; controls station furniture and partitions [can share space with SMI to start].	C. Stebbins	12-Feb-18	6-Feb-18	Closed	This is a good suggestion and we are making schedule adjustments to delay acquisition of some "nice to have, but not essential" items such as vibration isolation, fluorescence detector, and visualization hardware. These items will be essential eventually but are not needed at the start of commissioning. In regard to the control station, it will be necessary to acquire and begin to build it up early, to permit the possibility to test components for the JPLS station as they arrive without impacting the ongoing user and staff activities for the adjacent existing SMI station.
JPLS-CDR	CDR R18	Beam stabilization at the SSA is provided by SMI, any feedback on endstation positioners (stepper motors) will be slow and can be realized in EPICS: P. Ilinski recently reviewed beam monitoring/feedback options for the BST, including in-house electronics and resistive diamond XBPMs which might be significantly cheaper than the budgeted 30k$. Check available designs for beam visualization.	L. Berman	1-Feb-18	8-Dec-17	Closed	We are awaiting the implementation of XBPM feedback at SMI. At the appropriate time, we will consider external and internal sources for the XBPM and we will consult with existing beamlines to assess their satisfaction with the different solutions available. We do not believe this will significantly impact the budget.
PDR RECOMMENDATIONS							
JPLS-PDR	PDR R1	Perform a full calculation/simulation for the low-q limit(s) in SAXS mode. The calculation should be done at different beamstop sizes for the full range of energies and for beam dimensions possible.	B. Ocko	30-Apr-18		Open	An existing simulation that accounts for the pixel size will be extended to account for different beam stop sizes.
JPLS-PDR	PDR R2	Consider adding a tilt stage/goniometer option for the sample stage for non-liquid experiments and how it can be integrated with the processing equipment.	B. Ocko	9-Mar-18	9-Mar-18	Closed	This is an excellent idea. We have a simple, inexpensive design to provide a manual tilt along two directions.The design will provide afforance for motorized tilt.
JPLS-PDR	PDR R3	In the current design a set of filters/absorbers are located between the beam-defining slits and the sample which will inhibit SAXS. A separate set of absorbers is needed upstream of the slits for SAXS measurements.	B. Ocko	9-Mar-18	9-Mar-18	Closed	We have a second set of filters and these can be incorporated upstream. Note that such upstream filters decrease the monitor signal.
JPLS-PDR	PDR R4	Soller slits are helpful to cut down background noise. Soller slits would also be useful if the x-ray reflectivity arm is used for grazing incidence diffraction/scattering measurements. Consider including the capability to add Soller slits in the reflectivity arm.	B. Ocko	9-Mar-18	9-Mar-18	Closed	Soller slits are indeed helpful for reducing the noise in XR measurments when there is a wide beam (5mm), as with a conventional source. For small beams they are not effective and have the added complication of blocking some of the reflected beam in an uneven manner.

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JPLS-PDR	PDR R5	For the future incorporation of a CRL consider alternatives to Be lenses including Kinoform and Al lenses to have space provisions for these capabilities.	B. Ocko	9-Mar-18	9-Mar-18	Closed	We appreciate the excellent suggestion to use kineform lenses. Kineforms might be ideal at high, fixed energy. The horizontal beam width is well matched to the kineform etch depth and the ~1m to sample position is similar to distances at CHX. Aluminum lenses have been considered but the gain from the improved optical constant (fewer lenses) does not overcome the absorption losses.
JPLS-PDR	PDR R6	Consider purchasing a larger more robust chi stage to enable the use of double crystal configuration in the future and ensure the current layout enables the use of this at all energies and will not interfere with the SMI beampipe when in parked position. Engage with potential vendors to find realistic chi stage capabilities to prevent over spec'ing.	B. Ocko	30-Apr-18	nn-mmm-18	Ongoing	We have considered the purchase of a more robust chi stage. Until the current chi stage is fully evaluated and tested, no decision on this will be made. The more robust chi stage, such as the one used at the ESRF, appears to have the same diameter as the existing stage and hence should work ok. This will be confirmed.
JPLS-PDR	PDR R7	Consider the installation steps of the granite blocks and check whether the casters will be removable when the granite is in its final position.	D. Bacescu	9-Mar-18	9-Mar-18	Closed	The installation of the granite blocks will allow removal of the casters.
JPLS-PDR	PDR R8	Perform vibration measurements of existing systems with wedge mount blocks and granite supports and analyze.	D. Bacescu	25-May-18	nn-mmm-18	Open	We will explore whether similar vibration measurements have already been performed. If not, we will look for an existing location on the floor to carry out such measurements.
JPLS-PDR	PDR R9	A 4 wedge mount configuration may result in difficulties aligning the block and present problems with stability. Consider using 3 wedge mount adjustors instead of 4 to make alignment easier	D. Bacescu	9-Mar-18	9-Mar-18	Closed	After consulting with experts, a decision was made to support the bulk of the weight with 3 wedge mount adjusters. Two additional wedge mount adjusters will be added to corners and after leveling and positioning, these will be adjusted to carry a small fraction of the weight, thus providing some additional stability.
JPLS-PDR	PDR R10	Holes with threaded inserts should be included for mounting a plate near the cut-out in the granite block for the sample stage.	D. Bacescu	30-Apr-18	nn-mmm-18	Ongoing	This is an excellent idea. We will make provisions for adding the plate.
JPLS-PDR	PDR R11	The sample stage is capable of holding samples up to 200 kg. Consider these heavier samples and where their centers of gravity will be located when designing the plate for the samples. Test the sample stage with simulated loads to verify performance.	D. Bacescu	25-May-18	nn-mmm-18	Open	This is difficult to calculate, hence we will carry-out measurements to determine the maximum on and off axis loads.
JPLS-PDR	PDR R12	While attenuators can be used to prevent the beam from damaging the SAXS detector, this is not a preferred solution to avoid damaging the detector during beam setup or commissioning. Add beam stop paddle to SAXS detector design to prevent undesired beam damaging the detector.	D. Bacescu	30-Apr-18	nn-mmm-18	Ongoing	This is an excellent idea. We will add a paddle stop positioner to the beam stop. The protective cover (see below) will be made of aluminum so that it can also function as a full detector attenueator.

Review #	Reco #	Description	Owner	Scheduled Close	Actual Close	Status	Response
JPLS-PDR	PDR R13	Confirm that the Pilatus detector for WAXS includes a protective cover/lid and consider an additional horizontally sliding guillotine style cover.	D. Bacescu	30-Apr-18	nn-mmm-18	Ongoing	A sliding, protective guillotine style WAXS detector attenuator, constructed out of Aluminum, will be part of the design.
JPLS-PDR	PDR R14	Consider user access to sample stage and possibly add pads or ways to add protection to granite and users.	D. Bacescu	25-May-18	nn-mmm-18	Open	Different ways of protecting the granite will be explored as part of the final design
JPLS-PDR	PDR R15	If users will need to climb on to granite consult with ESH on whether a step is needed and ways to prevent someone from stepping into trough.	D. Bacescu	30-Apr-18	nn-mmm-18	Open	ESH will be consulted on this matter. This will be incorporated into the final design
JPLS-PDR	PDR R16	there are no beam diagnostics between the deflector and the SSA. Evaluate whether beam diagnostics are required upstream of the SCD for alignment or if BPM3 is sufficient.	B. Ocko	30-Apr-18	nn-mmm-18	Open	Consultation will be carried out with the SMI beamline scientist to ascertain what is required.
JPLS-PDR	PDR R17	Consider data collection for burst configuration of the Pilatus SAXS detector.	B. Ocko	9-Mar-18	9-Mar-18	Closed	The Pilatus detector does not appear to have a burst mode. This feature, three times the data rate for shorter acquisition times, is available with the Eiger. We will consider the Eiger if the version with larger pixel sizes is available in the near future.
JPLS-PDR	PDR R18	Implement synchronization between detector and fast shutter for preventing sample damage.	B. Ocko	9-Mar-18	9-Mar-18	Closed	Synchronization can be accomplished with the current software. If faster times, sub ms, are required we can add a Zebra box.
JPLS-PDR	PDR R19	Based on the importance of the refurbishment of existing components it is suggested to separate this out. Consider planning and scheduling to setup existing equipment and plan for equipment that needs to be tested, refurbished/upgraded and potentially re-tested.	C. Stebbins	12-Mar-18	nn-mmm-18	Ongoing	Additional detail regarding the setup & testing of existing equipment will be added to the integrated schedule in P6.
JPLS-PDR	PDR R20	Revise schedule to show this testing to be completed more aligned with detector receive-and-install and revisit staffing of DAMA.	C. Stebbins	12-Mar-18	nn-mmm-18	Ongoing	Schedule will be revised so that DAMA testing is completed after the detector is delivered & installed. Staffing requirements will be refined based on input from members of the DAMA group
JPLS-PDR	PDR R21	Review staffing requirements for the project and ensure these resources are available.	C. Stebbins	9-Mar-18	9-Mar-18	Closed	Staffing requirements for the project are reviewed monthly and updated accordingly. When a resource shortage within Complex Scattering is likely to occur, team will pursue support from other groups. This is particurly the case with Technical resources.

Review #	Reco #	Description	Owner	Scheduled Close	Actual Close	Status	Response
JPLS-PDR	PDR R22	Consider a contingency plan in the event there are issues with refurbishment and testing of reused components. Consider adding a miscellaneous budget item that will take up small budget overruns and small additions, without immediately 'breaking' the overall budget.	C. Stebbins	9-Mar-18	9-Mar-18	Closed	The largest risk is the existing equipment is the chi stage. The stage worked well enough at the APS using the same arrangement as with the JPLS design. Further, there are other chi stages in storage in 742 that we could use if metrology indicates that the present one won't perform to our specs. No additional budget will be added for contingency items.
JPLS-PDR	PDR R23	Consider controls for preventing SAXS collision with hutch walls and controls for pinch points and controls to prevent collisions with the SMI beam pipe during JPLS experiment setup/teardown.	B. Ocko	25-May-18	nn-mmm-18	Open	This is very important and we will work closely with the Controls Group. Funds have been budgeted for this task.
JPLS-PDR	PDR R24	Ensure re-used equipment is in accordance with current NSLS-II requirements. A list of electrical components needs to be made and sent to electrical engineering for EEI.	B. Ocko	30-Apr-18	nn-mmm-18	Open	The existing electronic hardware will be identified, a list prepared, and an inspection performed.
JPLS-PDR	PDR R25	A plan needs to be developed for the storage/movement of the SMI beam pipe when JPLS is in use.	D. Bacescu	9-Mar-18	9-Mar-18	Closed	The plan is to store the SMI pipe in the existing bracket. There is already a procedure on how to mount/dismount and handle the beam pipe.
JPLS-PDR	PDR R26	Check whether the shielding of the hutch downstream wall is sufficient to stop the mis-steered beam or if additional shielding (like the beamstop in other hutches) is required.	B. Ocko	25-May-18	nn-mmm-18	Open	This is important and we will carry out a calculation with consultation/cooperation with the Radiation Protection Group. If required, we will include additional shielding on the rear wall of the hutch.

Closed	26
Ongoing	6
Open	9