1 **Mini-Supporting Statement for**

2 **Alternative tools for improving CRP cost-effectiveness**

3 **Section A**
4 **(Generic Clearance: OMB Control No. 0536-0070)**
5

6 Please find attached all materials associated with this planned experiment under generic clearance
7 (OMB Control Number 0536-0070). If approved, the experiment will be conducted at The University of
8 Maryland under a cooperative agreement with Professor Peter Cramton, Economics Department,
9 University of Maryland, College Park.

10 Attachment list:

11 Attachment A - Email for recruitment
12 Attachment B - Experimental Design Protocol
13 Attachment C - White paper
14 Attachment D - Instructions
15 Attachment E - Questionnaire
16 Attachment F - Consent form
17 Attachment G - Disclaimer
18 Attachment H - Pretest report

19 # Overview
20 The experiment would compare alternative mechanisms for competitive purchase (auctions). These
21 experiments would address an important question in conservation program design. When the goal is to
22 purchase many identical items from a group of individuals, economic theory suggests that procurement
23 costs will be lower if competitive mechanisms, such as auctions or bidding, are used. In an effort to
24 harness competitive forces, the USDA has structured some of its signature conservation programs,
25 including the largest, the Conservation Reserve Program (CRP), as auctions.

26 In the CRP, farmers participate in a competitive auction by offering to enroll land for a payment. These
27 offers are ranked according to an index of environmental benefit and a cost metric. Each offer is
28 constrained by a parcel-specific bid cap. Both economic theory and practical experience from other
29 types of government auctions (e.g.: timber sales, toxic asset purchase, and communication spectrum
30 sales) suggest that modifying the current auction structure could make CRP more cost-effective.
31 Research (Kirwan et al., 2005)[1] estimates that $380 million or 20% of current annual payments exceed

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1 [1] *Kirwan, Barrett, Ruben N. Lubowski* and *Michael Roberts*, (2005), How Cost-Effective Are Land
2 Retirement Auctions? Estimating the Difference between Payments and Willingness to Accept in the
3 Conservation Reserve Program, *American Journal of Agricultural Economics*, **87**, (5), 1239-1247

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32 producer's costs. In the proposed research, we explore options for controlling costs by adjusting the bid
33 cap and/or using alternative auction mechanisms such as reference prices or groupings.

34 Subjects will be recruited from the student population at The University of Maryland (UMD), College
35 Park using a standard email (see Attachment A: Email for recruitment). Sessions will be conducted in a
36 classroom laboratory.

37 For more details on the specifics of the experimental design, please see Attachment B: Experimental
38 Design Protocol.

39 We also attach examples of the experimental materials to be used in the experiment: the instructions
40 for each of the five treatments (see Attachments D-Instructions) and the post-experiment questionnaire
41 distributed to subjects (see Attachment E: Questionnaire).

Justification

42 **1. Circumstances making the collection of information necessary**

44 Substantial USDA funds for conservation are distributed using competitive mechanisms.
45 Empirical evidence of the optimality of mechanisms is lacking. The standard economic
46 model used to analyze behavior in auctions is the game-theoretic model. Analytical
47 solutions for most real-world auction mechanisms, however, are impossible to derive.
48 Furthermore, the behavior of bidders in auctions often deviates from predictions of the
49 game-theoretic model. It has become standard practice in the analysis of auction design
50 to compare mechanisms using experimental testing. The first step of the testing
51 protocol is to test theoretically appealing mechanisms (loose bid caps, reference price,
52 endogenous reference price, and selection by grouping) against the baseline mechanism
53 (tight bid cap) in a laboratory setting.

54

55 **2. Purpose and use of the information collection**

56 This experiment would address an important question in conservation program design
57 by comparing alternative mechanisms for competitive purchase (auctions). When the
58 goal is to purchase many similar but not identical items from a group of individuals,
59 economic theory suggests that procurement costs will be lower if competitive
60 mechanisms, such as auctions or bidding, are used. In an effort to harness competitive
61 forces, the USDA has structured some of its signature conservation programs, including
62 the largest, the Conservation Reserve Program (CRP), as auctions.

63 Both economic theory and practical experience from other types of government
64 auctions (e.g.: timber sales, toxic asset purchase, and communication spectrum sales)

suggest that modifying the current auction structure could make CRP more cost-effective. In the proposed research, we explore options for controlling costs by adjusting the bid cap and/or using alternative auction mechanisms such as reference prices or groupings. The research question to be addressed by the study is:

Are there any significant differences in terms of procurement costs between the baseline mechanism (aka tight bid cap) and any of the four alternative CPR enrollment mechanisms (loose bid caps, reference price, endogenous reference price, and selection by grouping)?

The primary hypotheses to be tested will be univariate comparisons of expected cost under the five auction regimes (t-tests and non-parametric tests of expected cost).

The information from the proposed experiment investigating alternative CRP enrollment mechanisms will be shared with the Farm Service Agency (FSA) of the USDA. The FSA operates the CRP and is interested in exploring alternative enrollment mechanisms (ERS and FSA meet regularly and FSA has expressed interest both in the general notion of alternative mechanisms, and specifically in the mechanisms explored here). The experiment will be used as a preliminary test of three general types of alternative mechanisms. Note that an infinite number of variants are possible, but each variant that is proposed to be tested in this document fall under three labels:

1. Relaxed bid caps (relaxing the maximum price that is imposed by FSA on bidders in the CRP).

2. Grouping-based auctions (auctions which harness competition by asking ex ante similar parcels to compete among themselves before being considered in a national ranking).

3. Reference-price auctions (auctions which harness competition by ranking bids relative to an ex ante estimate of value).

The findings of the experiment will be shared with FSA in regular meetings that ERS and FSA hold. The primary outcomes of interest to both ERS and FSA are the cost-effectiveness of the auction mechanisms, i.e. the cost to procure a fixed number of parcels.

In addition, the research findings will be shared with researchers inside and outside the agency through seminars and training sessions. They may also be prepared for presentations at professional meetings or publications in professional journals.

3.   Use of improved information technology and burden reduction

99   As referenced in the parent supporting statement of the generic clearance (pg 4).

100   ERS will employ information technology as appropriate to reduce the burden of
101   respondents who agree to participate in its research.

102   ERS plans to use a single general method of information collection, in-person group
103   experiment activities will be held at university computer labs. Computer assisted
104   participation will be used when possible; else, paper and pencil will be used.

105   The proposed experiment will be conducted in a university experimental economics
106   laboratory at UMD, College Park.

107

4. Efforts to identify duplication; use of similar information

109   A literature review was completed. Much of the relevant literature has been produced
110   by the Principal Investigators (PIs) of this project, especially Nathaniel Higgins and Daniel
111   Hellerstein. In addition, we have partnered with Professor Peter Cramton, Economics
112   Department, UMD, one of the foremost market design economists in the world. A white
113   paper co-authored by the ERS PIs and Cramton, Economics Department, UMD reviews
114   the relevant literature, market design concepts, and applicable practical knowledge
115   (Attachment C).

116   The literature review revealed that there are no relevant studies of similar mechanisms
117   in the context of a multi-unit auction with many bidders. There is a long tradition of
118   experimental auctions more generally (see for example Lusk and Shogren, 2007[2]) and of
119   the study of the CRP (Latacz-Lohmann and Van der Hamsvoort, 1997[3]), but there are no
120   studies – experimental or otherwise – directly comparing the proposed mechanisms,
121   which ERS has selected in consultation with FSA. The proposed mechanisms compare to
122   a baseline (an auction mimicking the current CRP) the three mechanisms listed above:
123   "relaxed" bid cap (using an individual-specific maximum bid that is higher in expectation
124   than the baseline), grouping-based auction (also explained in more detail in Attachment
125   B - Experimental Design Protocol), and two variations on a reference price auction
126   (explained in more detail in Attachment B - Experimental Design Protocol). These
127   mechanisms are the ones that FSA is interested in considering, making the testing
128   appropriate at this time.

5   [2] Lusk, Jayson L. and Jason F. Shogren (2007). Experimental Auctions. Cambridge University Press, Cambridge, UK.
6   [3] Latacz-Lohmann, Uwe and Carel Van der Hamsvoort (1997). "Auctioning Conservation Contracts: A Theoretical
7   Analysis and an Application," *American Journal of Agricultural Economics*, 79: 407-418.

129	We view this test as a first step in producing experimentally-valid knowledge (knowledge where
130	the internal validity of the causal mechanism is not in question). Further testing, including field
131	testing, is an obvious next step.

5. Impact on small businesses or other small entities

No respondents will be small businesses. All respondents for this study will be students recruited to participate in experiments on the campus of UMD, College Park.

6. Consequences of not conducting data collection, or of collecting information less frequently

As referenced in the parent supporting statement of the generic clearance (pg. 5).

The proposed generic clearance mechanism will allow the development of more robust and efficient measures regarding agricultural behavioral economics, with minimal burden, that will benefit subsequent ERS and USDA information collections.

The quality of research that ERS can provide to its stakeholders will be increased if ERS is able to utilize state-of-the art experimental research mechanisms. The quality of quantitative research and its contribution to prospective policy will especially benefit under the proposed generic clearance. Experimental studies are often the only empirical tool that can be used to evaluate economic mechanisms that do not exist in the real world.

7. Special circumstances that would cause an information collection to be conducted so as to require respondents to report information to the agency more often than quarterly

There are no special circumstances associated with this information collection. All responses will be one time responses.

8. Comments in response to the Federal Register Notice and efforts to consult outside the agency

 This mini-clearance has not been posted in the Federal Register and so not comments have been received from the public.

We have consulted with – and will work throughout the process with – Peter Cramton, a Professor of Economics at UMD College Park and a leading expert in auction design.

| 159 | Cramton helped directly in the design of the mechanisms to be tested and in the |
| 160 | experimental protocol. |

9. Explanation of any payment or gift to respondents

162   As referenced in the parent supporting statement of the generic clearance.

163   The experiment will be conducted using money payments to participants in the
164   experiment. Consistent with the underlying scientific foundations of the experimental
165   economics, a fundamental requirement of the research methodology is that participants
166   value their time and treat the task of bidding seriously (as referenced in the parent
167   supporting statement of the generic clearance). Each student will compete in multiple
168   rounds (12-15) of 3 different auctions (36 to 45 total rounds) within a 90 minute time
169   period (see Table 1.). They will receive a cash payment based on the experimental
170   market outcome which results from each student's behavior.[4] The cash payment will be
171   of uncertain value before the experiments take place, but we do not expect any
172   payments in excess of $50[5][6] The average payments will be approximately $25. While a
173   maximum cap would be desirable, given that the market equilibrates within the
174   experiment and we are specifically testing a treatment without price caps, we cannot
175   guarantee that someone will not earn more than the $50 if we calibrate the ECUs for a
176    $25 USD average payment. The payments listed here are for the entire 90 minute
177   session, i.e. all auctions participated in by a given individual. Although individuals
178   participate in many rounds within a session, individuals are paid at the end of the 90
179   minute session based on 2 randomly-drawn rounds for each auction type (for example,
180   in a session for one treatment that includes 12 rounds, experimentalists will draw two
181   rounds at random to be the auctions on which payment is based). This practice
182   prevents any *wealth effects* from distorting the findings of the experiment.[7] This

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8 [4] The number of auctions participated in by each individual within a session will be identical, but may vary across
9 sessions. For more details, please see Attachment B - Experimental Design Protocol.
10 [5] We are using $50 because the maximum payment in the pre-test which was less competitive (fewer people) than
11 the proposed experiment was $53 when the ECU were converted into dollars.
12 [6] Because auctions are competitive, it is not possible to directly limit the earnings that can be generated by
13 participation without an explicit limit – a price cap. Because this experiment includes auctions *without* price caps
14 as a very explicit treatment, it is not possible to *guarantee* that payments greater than $50 will not be made.
15 Competition, however, is an excellent check on high payments. All auctions will be competitive and payments
16 above $50 will be exceedingly rare. Furthermore, the payment design can be changed after the completion of a
17 session, further reducing payment risk. That is, if in live testing – which by definition cannot be conducted at scale
18 with 16 bidders until PRA clearance is received – individuals earn amounts in excess of the planned maximum, the
19 rate of exchange between "experimental dollars" (the currency used in the experiment and displayed onscreen to
20 the experiment participants) and $U.S. can be modified to ensure that payment stay within the proposed range in
21 future sessions.
22 [7] *Wealth effects* are the theoretical changes in behavior that occur after a given individuals' wealth increases. Since
23 the CRP is a "one-shot" auction – there is only one CRP auction conducted at a moment in time, not a series of CRP
24 auctions – it is necessary to eliminate wealth effects.

183   practice is standard in the literature.[8] Therefore, their payments will be based on the
184   sum of 6 randomly drawn rounds: 2 per each auction type. The minimum payment will
185   be 7 USD for "showing up".

186

187

Table 1. Experimental Design					
Session	Treatment[*]	Average # of rounds per treatment	Max # of rounds per treatment	Time (in minuties)	# of participants
1	1,2,3	12	15	90	16
2	1,2,4	12	15	90	16
3	1,2,5	12	15	90	16
4	1,3,4	12	15	90	16
5	1,3,5	12	15	90	16
6	1,4,5	12	15	90	16
7	1,2,3	12	15	90	16
8	1,2,4	12	15	90	16
9	1,2,5	12	15	90	16
10	1,3,4	12	15	90	16
11	1,3,5	12	15	90	16
12	1,4,5	12	15	90	16

* Random order of treatment within session.

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189   The planned payment amounts are in line with the current payment structure utilized in
190   the experimental laboratory at the University of Maryland, College Park. We developed
191   the payment structure in consultation with Professor Cramton, UMD, and his graduate
192   students who run the lab (and who implement the experiments at the lab). In the last

25   [8] See "Incentives in Experiments: A Theoretical Analysis" by Azrieli, Chambers, and Healy.
26   http://www.econ.ucsb.edu/about_us/events/seminar_papers/Healy.pdf.

193   three years, experiments conducted at the Experimental Economics Laboratory at UMD

194   have, on average, provided an hourly payment of 16 to 18 USD for undergraduate

195   students. This amount implies that for 90 minutes of participation in an experiment the

196   approximate payment will be between 24 and 27 USD. That is 25 USD for 90 minutes is

197   in the range of earnings typical for the practices of this laboratory. See the table in the

198   following open link for detailed information for four of the latest research work

199   conducted at the Laboratory:

Recent papers whose experiments were conducted at UMD Exp Econ Lab					
Paper	Authors	Average Payment USD	Approximate Duration (mins)	USD Payment / hour	Payment for 1.5 hours
"On the Demand for Expressing Emotions"	Brit Grosskopf; Kristian Lopez Vargas	13	45	17.3	26.0
"Risk Attitudes and Fairness: Theory and Experiment"	Kristian Lopez Vargas	17	60	17.0	25.5
"Multi-Object Auctions with Resale: Theory and Experimen"	Emel Filiz-Ozbay, Kristian Lopez-Vargas and Erkut Y. Ozbay	19	70	16.3	24.4
"Do Lottery Payments Induce Savings Behavior? Evidence from the Lab"	Emel Filiz-Ozbay; Jonathan Guryan; Kyle Hyndman; Melissa Kearney; and Erkut Y. Ozbay	18	60	18.0	27.0

200   Note carefully that these are *average* payments. We intend for our average payments

201   to fall within the range here, but the maximum payment will likely be larger than 25 USD

202   and the minimum payment will be less than 25 USD due to the fact that in auctions (real

203   and laboratory) bidders will have different values and as such will each behave

204   differently which causes earnings to vary.

205   The discussion above is focused on academic literature and common practice in

206   economics, rather than common practice in government-sponsored information

207   collections where monetary incentives to respondents are in general allowed only under

208   special circumstances. In an effort to use the scientific best practices above in a

209   government-sponsored research study, we propose an experimental protocol that

210   involves special oversight by OMB. We will report to OMB the distribution of payments,

211   including the minimum, maximum, and average payments of each session after the first

212   experimental session and monthly thereafter. In addition, if any payment to a single

213   participant in excess of $50 occurs, we will notify OMB immediately. OMB will reserve

214   the right to pause the collection if large payment outliers become a significant concern

215	during the experiment. In such a case, we will consult with OMB for identifying
216	appropriate methods to address this issue. The experiment may be resumed only after
217	obtaining further OMB approval.

218	Because it is common to get a number of no-shows and last-minute cancellations for a
219	given experiment session, and because it is important to have a particular number of
220	participants in each session, we plan to "overbook" our sessions by 2 students to ensure
221	we have the right number of individuals (16) to run the experiment. We will do our best
222	to avoid it, but experience suggests that in some cases more people will show up than
223	can be accommodated for a given session. In this case, each extra who show up before
224	the scheduled start time will receive a $7 payment for time and travel and can
225	reschedule for another session. This is common practice among experimentalists. For
226	instance: "Given the high cost of cancellations due to insufficient attendance, most
227	researchers err on the higher side and pay a decent sum to the extra subjects who
228	present themselves on time to avoid alienating them as future recruits...."[9] Friedman
229	and Sunder do not discuss what is meant by "a decent sum." The regular practice at
230	each lab around the world varies. We set our payment amount, which is only for those
231	individuals who do not participate in the experiment (and thus the figures listed above
232	for average payments for participants are entirely separate), at the level used by
233	researchers at the University of Maryland, College Park. This is the payment always
234	used at this institution with the population we intend to target with the proposed
235	experiment.

| 236 | |

10. Assurance of confidentiality provided to respondent

| 238 | Respondent data will be protected by the Privacy Act of 1974 (5 USC 552a). |

239	Subjects will sign a consent form at the start of the experiment. They can withdraw
240	from the study at any time. Subjects will receive an ID number that we will use to keep
241	track of their bids and to match bids with background questionnaires used for control in
242	regression analysis. Students will have to sign their names to a receipt but this sheet
243	will be kept separate from the bids.

| 244 | ERS researchers will not have access to participant names at all, and participant names |
| 245 | will not be stored on government computers. |

| 27 | [9] D. Friedman and S. Sunder, Experimental Methods: A Primer for Economists, Cambridge |
| 28 | University Press 1994, p. 54. |

246	ERS has decided not to invoke the Confidential Information Protection and Statistical
247	Efficiency Act of 2002 (CIPSEA). The complexity and cost necessary to invoke CIPSEA is
248	not justified given the nature of the collection; the collections would generally be designed
249	to be hosted in university computer labs, where CIPSEA compliance cannot be assured.

| 250 | **11. Justification for sensitive questions** |

| 251 | No sensitive questions will be asked. |

| 252 | **12. Estimates of hour-burden including hourly costs** |

253	Based on the extensive experience of the principal investigators in running experiments,
254	as well as a pre-test conducted on 30 June 2014, this laboratory study will take
255	approximately 90 minutes (and possibly less) for each participant to complete. We plan
256	to conduct 12 sessions with 16 participants in each session. Therefore, we expect to use
257	a total of $12*16*1.5 = 288$ burden hours to conduct the experiments for this study.

258	In order to recruit subjects for this study an email will be sent to students at UMD,
259	College Park, announcing the opportunity to participate. The UMD, College Park
260	experimental economics lab maintains a database of students who have expressed
261	interest in participating in economics experiments at UMD, College Park and who have
262	shared their email addresses with the economics department. Signup rates to
263	solicitations on this list are 5%.[10] Per previous discussion in A.9, we plan to "overbook"
264	each session by 2 potential participants as backups to ensure we have the right number
265	of individuals to run the experiment. Therefore, if the response rate to our solicitation is
266	exactly 5%, this would imply we would need to email 4,320 students in order to obtain
267	216 ($12*18=216$) participants. In order to be sure we obtain a sufficient number of
268	responses, we plan to email participants in waves of 300 (approximately the number
269	necessary to obtain one full session of 16 subjects). We estimate that participants will
270	require five minutes to read the recruitment email and respond that they would like to
271	attend an experiment. This will result in the use of 18 burden hours (5 minutes X 216
272	affirmative responses). We estimate that it will take individuals two minutes to read the
273	entire email and decide not to respond. This results in a total of 136.8 burden hours (2
274	minutes X 4,104 nonresponses).

| 275 | The total number of burden hours used for this study will be the sum of recruitment |
| 276 | burden hours and experimental burden hours: $288+ 18 + 136.8 =442.8$. |

Instrument/	Sample	Freq	Responses	Non-response	T

| 29 | [10] Personal communication with UMD cooperator. |

experiment	Size		Resp. Count	Freq X Count	Min./ Resp.	Burden Hours	Nonresp. Count	Freq X Count	Min./ Resp.	Burden Hours	Bu H
Recruitment email	4,320	1	216	216	5	18	4,104	1	2	136.80	1
Experiment	192	1	192	192	90	288	0	0	0	0	
Total	**4,320**		**216**			**306**				**136.80**	**4**

277

13. Estimate of other total annual cost burden to respondent or recordkeepers

279 There will be no capital, operating, or maintenance costs to the respondent as the result
280 of participation in an information collection under this generic clearance.

14. Estimate of costs to the Federal Government

282 The Federal Government has funded this research through a cooperative agreement
283 with The University of Maryland. The total reimbursable cost of this cooperative
284 agreement will be $66,000. ERS staff time for this agreement will be $20,000. Total cost
285 to the government will be $86,000.

15. Changes in burden hour

287 This is a new data collection.

16. Plans for tabulation, publication, and project time schedule

289 If approved, this research will be completed within six months of approval. Data will be
290 analyzed and a report will be written in 2015. The results of the experiment will be
291 shared in a memo and in meetings with FSA. The primary hypotheses to be tested will
292 be univariate comparisons of expected cost under the five auction regimes (t-tests and
293 non-parametric tests of expected cost).

17. Reasons display of OMB expiration date is inappropriate

295 No exemption is requested.

18. Exceptions to certification for paperwork reduction act submissions

297   No exceptions to certification are requested.

298