Complete List of Comments and USNG Ad Hoc Working Group Responses
FGDC USNG Public Review, March – June, 2001
September 12, 2001

#	Source	Paragraph subpara PG#	Figure Table line #	Type	Comment	Proposed Change	Response
1	Budlong-1				Excerpts from the specification are quoted below. Expecting the proposed location id's to be understood and remembered by "communities across the nation", and students in the schools system, is just plain unrealistic. The id's will look like gibberish to all but a very small number of dedicated, precision-minded people. At least, provide some punctuation, and mnemonic clues. Antique as the old public land measuring system is, at least they recognized the human character, and used words such as Range, Township, and San Bernardino Meridian. The excerpts: ---------- "A single system that can be taught to all citizens in the school system, and that can be used in any community across the nation. " ---------- 18SUJ20 - Locates a point with a precision of 10 km 18SUJ2306 - Locates a point with a precision of 1 km 18SUJ234064 - Locates a point with a precision of 100 meters 18SUJ23480647 - Locates a point with a precision of 10 meters 18SUJ2348306479 - Locates a point with a precision of 1 meter ---------- For example, the location of the Washington Monument in Washington,		**Accepted in part.** Annex D of the new draft has been revised to allow for use of spaces to make it easier to read USNG coordinates. Formally, coordinates without spaces are preferred and are expected to be used within systems and as the default for user presentation. Informally, spaces may be used as an alternative for user presentation. Also see response to Comment 5. As for the suggestion to use township and range – as user friendly as that system may be for some, it is not universally defined for the U.S. and is not uniform enough where it is defined to be used in conjunction with GPS and therefore is not a consideration.

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					DC can be identified in NAD 83 datum. General reference: 18SUJ23480647 Special application: 18SUJ2348316806479498		
2	CECOM-1				The draft USNG document has been reviewed by this office and CECOM C2Dsupports the effort. A few general and specific comments are provided in theattachment		**No Response**
3	CECOM-2				General Comments: The USNG system requires that users be able to reference maps in the WGS 84 datum with MGRS (UTM) markings and have access to a GPS or similar position location device. The user would need to be trained to read MGRS notation and understand the meaning and necessity of operating in WGS 84 and not a local datum. This is a concern because many older map products may still use the NAD 27 datum. The general user would probably encounter difficulties in understanding grid boundary crossings and convergences. Also, locating or reading map positions accurately might require some sort of measurement device, especially if spatial position precision is one meter.		**No Action.** It is the inherent problems of different datums and the difficulty of measuring coordinates accurately from various map projections and grid systems that has prompted the development of this standard. All of the issues mentioned in this comment have been considered in the selection of the specific solution contained in this draft specification.
4	CECOM-3	1. Page 4, line 223			Change “schema” to “scheme”.		**Not Accepted.** The term “schema” is taken from the scope statement of ISO/DIS 19111 and is appropriate here. The term is in common use in international geographic information standardization.
5	CECOM-4	2. Page 8, lines 307 to 311			Unless otherwise required, it is recommended that MGRS position display include spaces to simplify reading. e.g., line 311 should read “18S UJ 23483 06479” rather than “18SUJ2348306479”.		**Accepted in Part.** A spatial reference is formally written for general applications as an entity without spaces, parentheses, dashes, or decimal points as depicted above. For informal uses, the suggestion to break a spatial reference into sections has been included in the standard. Also see the

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							response to Comment 8.
6	CECOM-5	3. Page 17, line 393			Recommend the corresponding WGS 84 coordinate,18SUH06939701, also be included here.		**Accepted in Principle.** We agree with the comment, but the line in question has been deleted from the final draft.
7	CECOM-6	4. Page 21, line 435			Recommend “conterminous” be changed to “contiguous”. “contiguous” is a more generally understood term.		**Not Accepted.** Although “contiguous” may be a more generally understood term, “conterminous” is more appropriate here. Contiguous means adjacent or sharing a boundary, whereas conterminous means contained within a single boundary. All of the states in the “lower-48” are not contiguous with each other, but they are all conterminous.
8	CECOM-7	5. Page 24, line 512			See [CECOM] comment 2		**No Action.** See response to CECOM 2.
9	Colvo-1	Objective.			As a long time map maker (over 50 years), Past President of the ASPRS, and one who first noted in 1965 (Ph.D. dissertation) that a uniform plane-coordinate reference system was badly needed for general use, I feel qualified to comment on this critical issue. Three specific comments follow as referenced to the STANDARD as received. ...In summary, I strongly recommend that USNG, with minor changes such as herein suggested, be approved and implemented with a minimum of further delay.		**No Response.**
10	Colvo-2	Scope			From lines three and four delete "Because they will all"	Substitute "When they"	**No Action.** The referenced phrase could not be located.
11	Colvo-3	Scope			Line three. Delete "From approximately 1:5000 to" (Note: There is no technical limit as to how large a scale a plane coordinates may be used. At 1:1,000,000 and smaller scales, spherical coordinates such as latitude and longitude are more practical for depicting the curved earth's surface.)		**Accepted.** A change regarding scale limitations has been incorporated into the proposed standard. There is now no large-scale limitation on the applicability of the standard.
12	Colvo-4		[line 205 – 206]		Last sentence should be deleted.	Replace the last sentence with the following, "The state plane coordinate system (SPCS), Public Land Surveys	**Accepted.** The following was added following line 206 of the public review draft (line 211 in the final draft), "The

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						(PLS) and other accepted local spatial reference systems will continue to be used where preferred for property discriptions and other specialized uses."	state plane coordinate system (SPCS), Public Land Surveys (PLS) and other accepted local spatial reference systems will continue to be used where preferred for property descriptions and other specialized uses."
13	Daumiller-1				Hello,I am writing to oppose the idea of the U.S. National Grid Standard.The USNG requires combining a zone number, two alphabetic coding systems(the second of which is not consistent from one zone or grid square tothe next), and portions of two coordinates into a single variable-lengthstring. I fail to see how this can be considered to simpler than the UTMcoordinate system, with three simple, clearly separated components.I don't believe that anyone would use this system. I believe it would be a waste of time and money to print the USNG information on USGS maps.The UTM system meets all of the objectives specified for the USNG except for the ability to be truncated for lower precision.This is my personal opinion, which does not represent the posistion ofthe State of Montana or the Montana State Library.		**Not Accepted.** The format used by the USNG is modeled after a well-proven and mature system. A large user community has found this format simple and easy to use. (See example comments 56 [Maak-1], 15 [FEMA-1], and 96 [Winfield-1].) The two-letter 100,000-m Square Identification scheme is applied in a manner from one zone to the next, with it repeating every three zones (18° of longitude – see Figure 2) and shifting in the northing direction. This extensive distance between the repetitions of two-letter combinations adds to the utility of this reference system by design. The exceptions the Commenter notes regarding limitations of the UTM coordinate system are the reasons the MGRS model reference system was adopted. A better description of the UTM's deficiencies is the MGRS scheme allows the user to 1) truncate a spatial reference value, and 2) vary the precision of the spatial reference value depending on the user's needs.
14	DePriest-1				I like the idea of a standardized system but you are just proposing an existing system without addressing some of the concerns necessary tomake it easy for the user. For example the telephone company will tellyou that you can string 10 digits together without a break. I suggestthe proposal include a space or a hyphen after 5 digits to separate eastings from northings. I would also suggest that the system always be10 digits since this		**Accepted in Part.** A mandatory use of 10 digits (1-meter precision) clearly would not always be in the best interest of the users. A large body of experience has shown the simple rules for applying variable precision are very usable by the average person and are a major advantage of this system. This suggestion will not be incorporated. The suggestion to separate a USNG

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					is simpler for a user and covers all the cases. Having a variable width works of course but can be confusing and errorprone for the user. I would also suggest that WGS84 be used for thestandard datum. This system is for the public and not a bunch ofsurveyors who need to move to the uniform world wide system anyway. These days a system needs to be worldwide.Dale		spatial reference value into three segments for easier reading in informal usage has been incorporated into the proposed standard in Annex D. (Also see response to Comment 8) Regarding WGS84 being the standard datum, NAD 83 and WGS 84 are considered the same.
15	FEMA-1				The Federal Emergency Management Agency (FEMA) supports the adoption of the US National Grid (USNG) as a standard for the horizontal reference mapping in the United States. The FEMA program offices anticipate that use of this system for identifying locations among emergency management personnel and agencies will help save lives, reduce the costs of disaster, and enhance preparedness, response, recovery, and mitigation efforts. Particularly valuable is its compatibility with the system used by the National Guard and others, the Military Grid Reference System (MGRS). The USNG standard also appears reasonably compatible with current capabilities of the Global Positioning System (GPS), and has the potential to be quite effective as a locational tool if future GPS devices adopt the standard. FEMA recommends that the FGDC adopt the USNG system as the horizontal reference system for all general-purpose mapping.		**No Response.**
16	FGDC-Robinson-1	p. ii	2nd para	T	Description of FGDC omits several agencies	Include Defense, Justice, Transportation, and HHS.	**Accepted.** The boilerplate page has been updated to match Directive 6.
17	FGDC-Robinson-10	P.2	Line 173	G	See above [[Comment 51 – FGDC –9]	Delete preferred	**Not Accepted**. See response to Comments 38 [FGDC 3] and 51 [FGDC 9].
18	FGDC-Robinson-11	P.2	Line 173	T	Include the specific map scales that you are referring to in the text. Large and medium are ambiguous	Replace “for large and medium-scale mapping applications.” With “for maps scales from approximately 1:5000 to	**Accepted but Modified.** This has been revised but we also eliminated the large-scale limitation (see Comment 11) so

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						1:1M." delete footnote.	the change was to refer to "scales larger than approximately 1:1,000,000."
19	FGDC-Robinson-12	P2	Line 174	G	Regarding the various level of precision it would be useful to define what the levels of precision one would use with a particular map scale this might also reflect a positional accuracy relationship since this system is intended for location appliances they would need some simple guidance on what a facile user interface would display and reflect the accuracy of the position that they can obtain with the appropriate precision.	Suggest that a table be developed giving guidance on precision display that considers accuracy and scale. Use it to expand on section 3.3.3 i.e. what map scale is consistent with precision of 10km what positional accuracy is required to be consistent with 10km precision display?	**Not Accepted.** The intent of this specification is to provide general guidance for placing USNG grid lines on existing map products. Of particular concern is whether it is appropriate to accurately place a USNG grid on a map that does not already meet some minimum standard for accuracy. A table that addresses precision for various accuracy and scales is not needed to provide the general guidance intended. The specific table suggested would be a valuable addition to this specification, but as described it would be a generic statement of accuracy not limited to this standard and therefore its creation is outside the scope of this standard.
20	FGDC-Robinson-13	P2	L-175	G	Why not call USNG the Military Grid Reference System? After all that's what it is. Name USNG is misleading.	Consider using MGRS instead of USNG or using a name similar to MGRS like National GRS (NGRS) or Civil & Military GRS (CMGRS)	**Not Accepted.** The USNG is modeled after the MGRS, but is not the same. For example, the MGRS has more than one 100,000-m Square Identification scheme, while the US National Grid has only one. Furthermore, we believe that there is potential for considerable confusion if the USNG were called the "Military" grid reference system, since that might be interpreted as a system that was meant to apply only to the military. The comment does not explain how the name "United States National Grid" is misleading. We respectfully disagree with that assertion. It is a grid. Its application is intended to be national in scope. And the nation to which it applies is the United States.
21	FGDC-Robinson-14	P2	Line 183-185	E	"This standard is for use in the acquisition or production, either directly or indirectly through contracts and partnerships, of printed maps and the	Suggest: This standard is for printed maps and location service appliances.	**Not Accepted.** This comment seems to be based on a misunderstanding of how applicability is usually specified within a Federal government standard. This

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					acquisition, either directly or indirectly, of location service appliances." Wordy and unclear		wording follows that used for FGDC Metadata in Executive Order 12906 and in almost all FIPS.
22	FGDC-Robinson-15	P2	Line 185	T	"geospatial coordinate" does not fit here	Suggest: The USNG facilitates the human interface of products and services designed as interoperable components of the NSDI.	**Not Accepted.** We respectfully disagree with the assertion that "geospatial coordinate" is inappropriate here. The comment does not explain how or why it is inappropriate. The proposed change would change the intended meaning and cannot be accepted without further justification.
23	FGDC-Robinson-16	P3	Line 196-200	T, E	"Use of USNG grid coordinates may be useful or even desirable within some systems or enterprises. The decision to use USNG grid coordinates or some other coordinate system internal to geographic information systems or location service appliances is left to the discretion of the system developer as long as the human interface provides for USNG grid coordinate readout as one option." Can this standard require this or should this be under compliance? Also wording seems unclear especially a "USNG grid coordinate"	Suggest: Use of USNG positions may be useful and desirable within some systems or enterprises. The decision to use USNG positions or some other coordinate system is left to the discretion of the system developer; however USNG position should be one option available to users and is required for compliance with this standard.	**Accepted in Principle – No Action**. Of course a standard can require this. It is up to the potential user of the standard to decide whether he will conform to that requirement or not. Therefore, we agree with the suggestion that this concept should be captured in the Conformance clause (Clause 2). We have determined that it was already captured there and took no action.
24	FGDC-Robinson-17	P3	L 202-207	T, E	This section seems unneeded and has some misrepresentations. The NGS has established the SPCS, but at the request of, and after collaboration with state government. Also few states require SPCS use for cadastral surveys	Suggest: The USNG is not applicable to surveying. This standard does not attempt to replace the State Plane Coordinate Systems (SPCS).	**Accepted in Part.** Also see the response to Comment 12. The sentences in question have been changed to read: "The USNG is not designed for surveying. This standard is not intended to replace the State Plane Coordinate Systems (SPCS) established by the National Geodetic Survey. The SPCS is specifically designed to meet the requirements of surveyors and engineers in determining location and boundaries and some states mandate its use for specific purposes. SPCS coordinates can be readily converted to USNG grid coordinates for subsequent use within the NSDI."
25	FGDC-	P4	Line	G,	"Research and testing" Has this been	Add references about this research and	**Accepted as Modified.** The purpose

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	Robinson-18		235	E	published?	testing in the reference section or delete all such language.	of this mandatory section of an FGDC standard is to record how the standard was developed. There are no specific requirements for how that work is to be done. It is inappropriate to delete references to activities just because they do not meet someone's personal definition of what constitutes research and testing. However, we agree that the present wording might cause one to infer that formally published test results exist when they do not. So we have modified the language in this clause to discourage such an inference. Extensive informal (and unpublished) research and testing of various issues regarding development and use of this standard have taken place over the last several years. The results of these efforts are embodied in the standard itself. The last two sentences of paragraph 1 of section 1.5 have been changed to read: "The Public XY Mapping Project developed the idea of conducting informal tests and surveys to determine which coordinate reference system best net the requirements of national consistency and ease of human use. Based on its findings, a standard based on the MGRS was adopted."
26	FGDC-Robinson-19	P5	L 255	G, E	"A-16" should be "OMB circular A-16" better still why not say FGDC agencies?	Replace A-16 with FGDC	**Accepted.**
27	FGDC-Robinson-2	p.ii	2nd para Line 41&42	T	Why is the last sentence regarding the cadastral sub committee there?	Delete last line of paragraph	**Accepted as Modified.** Also see response to Comment 16. The boilerplate page was updated to match FGDC Standards Directive 6 and the line in question was not deleted, but modified to read: "The Department of the Interior chairs the committee."
28	FGDC-	P7	L 273	E,	Why is it basic? What is a basic	Delete: Basic	**Not Accepted.** UTM numbering forms

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	Robinson-20		& 275	T	coordinate? What is basic numbering? Is it USNG numbering?		the “base” for the USNG numbering, therefore, it is “basic” as defined by Webster.
29	FGDC-Robinson-21	P8	L 296	T	“ unique letters” these letters are recursive and not unique	Clearly state that the 100km Square identification is unique within each GZD, but caution that it is not unique by itself but repeats in other GZDs as shown in the figures. Or just drop the word unique	**Accepted.** The sentence has been changed to read: “Each GZD 6x8 degree area shall be covered by a specific scheme of 100,000-meter squares where a two-letter pair identifies each square.”
30	FGDC-Robinson-22	P8	L 304	E, G	It may be useful to some to see X coordinate value and Y coordinate value associated with Easting and the Northing	Easting (E) (X coordinate) and Northing (N) (Y coordinate)	**Not Accepted.** The proposed change is in conflict with widely used and well defined convention as well as in conflict with ANSI X3.61.
31	FGDC-Robinson-23	P8	L 314-315	T	The number of digits should reflect the accuracy of the position (see: FGDC-10) Could you have more east digits and fewer north digits? What is the practical limit for precision?	Delete: “The number of digits in Easting and Northing can be varied, depending on specific requirements or application.”	**Not Accepted.** The number of digits in the coordinate determines the precision of the position, not the accuracy. The sentence has been retained but moved to the paragraph preceding the examples in an attempt to improve clarity. Regarding the question of whether you could you have more east digits and fewer north digits, the review draft read: “An equal number of digits shall be used for E and N . . .”. We thought that was clear but have modified the final draft to read: “An equal number of digits shall always be used for E and N.” The Easting and Northing axis are symmetrical in their number of digits. As for the "practical" limits on precision, it depends on user's definition of the word, "practical". For all but special applications, the limit on precision is normally 1-meter. This format provides the user flexibility in determining the level of precision they require for a particular application of the US National Grid, and is one of the main reasons the USNG was modeled after the MGRS format.

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32	FGDC-Robinson-24	P9	L 319-320	T	Is ITRF a Datum?	Delete ITRF or clarify	**Accepted with Explanation.** This is the wording suggested by the USGS representative to the interagency council that manages the Global Positioning System. The ITRF is a reference frame for positioning and functions similar to the way an ellipsoid or geoid does for a datum. It is a fundamental component of positioning when using a satellite constellation like the GPS, which cannot be referenced to a "datum" in a traditional sense. The reference is correct, but it cannot be explained without describing details of geodesy that are well beyond the scope of this standard. Even though this is the only objection to the reference, we have determined that it is not fundamental to the standard, and have deleted it.
33	FGDC-Robinson-25	P10	L 328	G, T	Why? How can you enforce this? What about the Geospatial Positioning accuracy standard? What about the locational service appliances? See FGDC-10. NMAS is obsolete and should not be referenced	Better develop and explain USNG accuracy and precision or delete section	**Not Accepted.** NMAS is not obsolete and the new Geospatial Positioning Accuracy Standard does not supercede it entirely. The FGDC Geospatial Positioning Accuracy Standard actually indicates when it is appropriate to reference NMAS. Nevertheless, we concurred that this section could have been developed further and considered what changes needed to be made. We determined that the accuracy thresholds provided by the NMAS, which we are referencing, could be restated according to the reporting methodology established by the FGDC Geospatial Positioning Accuracy Standard. However, the restatement of the NMAS accuracy thresholds are beyond the scope of this standard. The resulting statement would have applicability much wider that this standard (as wide as the NMAS itself) and should be accomplished by the accuracy standards experts and incorporated into

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							the Geospatial Positioning Accuracy Standard and should not be undertaken by the authors of this standard. Until the appropriate body does that work, we have no choice but to reference NMAS when we are referring to an accuracy threshold.
34	FGDC-Robinson-26	P10	L 333, L341	T	Although USNG could be used for accuracies higher than 1m, is that the intent?	Delete "or higher"	**Not Accepted.** Although it is not the immediate intent to use the USNG for higher accuracies, we felt that it was important to indicate that it was capable of such use in the future, that is, that advances in technology or future refinement of the quality of the GPS signal would not make the standard obsolete.
35	FGDC-Robinson-27	P10	L347	T, G	Coordinates given do not agree with the published coordinates from the National Geodetic Survey see published values for Washington Monument from NGS data sheet (www.ngs.noaa.gov). Special application appears to be surveying something that was excluded earlier in the document. Clearly the practical limit of USNG is 1 meter as evidenced by the applicant's failure to know and provide known values to a higher degree of accuracy. The standard would be better if it is limited to the precision of 1 meter. This would give the display of user equipment a finite limit on the size of the character string while best reflecting the objectives of the standard.	Delete entire section on special applications.	**Not Accepted.** We cannot concur with the logic of this comment. Our ability (or anyone's for that matter) to provide a coordinate of higher accuracy or precision has nothing to do with the ability of the standard to support higher degrees of precision. Besides, the coordinates used in the proposed standard are the most precise and accurate available for the Washington Monument and the latest available from NGS. (See the e-mail below.) That would seem to prove that there is no practical limit of accuracy supported by this standard – if we try to follow the logic in the comment. From: Dave Doyle [mailto:Dave.Doyle@noaa.gov] Sent: Tuesday, May 15, 2001 11:41 AM To: Terry; Tom Terry Cc: Richard Hogan Subject: Re: Exactly Where is the Washington Monument Tom's position is correct. During a GPS campaign in 1999 we repositioned the

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							top of the Monument with GPS. While the GPS work has been completed for some time, we have hesitated to load the final values in the National Spatial Reference System (NSRS) until we complete our investigations of the leveling that was done back in the 1880s by the Army Engineers to check for subsidence. This has been a long term project and unfortunately we have had only minimal resources and time to dedicate to this activity. I hope to put this project to bed within the next 2 months. At that time the NAD 83 (1993) position of the monument will be changed to: Latitude = 38° 53' 22.08232" N Longitude = 77° 02' 06.86477" W UTM (Zone 18) N = 4,306,479.498 m E = 323,483.193 m
36	FGDC-Robinson-28	P10	L335	G, E	This section seems unneeded	Delete section	**Not Accepted.** This section identifies the coordinate precision that will satisfy "normal use" of the grid and is a good indication of the character-string length that should be supported for most applications. We believe the section contains useful information and it is retained.
37	FGDC-Robinson-29	P17	L 384-387	G, E	Why not include referenced figure? " Producers shall refer to National Imagery and Mapping Agency (NIMA), 1990, Defense Mapping Agency (DMA) Technical Manual 8358.1 Datums, Ellipsoids, Grids, and Grid Reference Systems, Edition 1, Appendix B, Figure B-4 for the labeling scheme used with NAD 27.	Include figure B-4 in document	**Accepted.** We agree. It is better to include the figure in the document along with the text that supports it. For technical reasons this was not possible in the Public Review draft and the alternative recommended by the FGDC standards directives of placing all of the figures in an annex was used for that draft. The final draft moves the figures into the body of the document.
38	FGDC-Robinson-3	P.1	Line 145	G	Why should this be the preferred grid for NSDI? There are many grids each has it's own benefits and user preferences. Let users decide if this is their	Delete "as the preferred grid for National Spatial Data Infrastructure (NSDI) applications."	**Not Accepted.** We agree that there are many grid systems and that each has its own benefits. If no preference is specified, users will continue to choose

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					preference.		different systems for different applications and there will be no progress toward a standard practice. A standard practice will allow people to exchange and use spatial reference values as a matter of routine. The benefits of having a single solution cannot be achieved without specifying a preferred grid. If the suggested change were made the resulting specification would standardize nothing. The public review was an opportunity for users to argue for the adoption of a grid system other than the one proposed here as the preferred grid. But since this comment has provided no alternative, no action can be taken.
39	FGDC-Robinson-30	P19	L 406	G, E	Foot note seems unneeded	Delete footnote	**Not Accepted.** For illustrative purposes the table shows a method of truncation that is not part of the UTM definition. The footnote is clarification of that. We believe that this note is important.
40	FGDC-Robinson-31	P19	L 412	G, E	Why is there a leading "+" for the UTM? Why not label the UTM values: zone, east, and north?	Delete "+" Label the UTM values: zone, east, north	**Not Accepted.** The portrayal of UTM values here is in accordance with ANSI X3.61-1986 - Representations of Geographic Point Locations for Information Interchange.
41	FGDC-Robinson-32	?	Figure 2	G, T, E	It would be helpful if the area in figure 1 matched figure 2. Also, why is there a double line along the 16-degree line? Is figure 2 drawn to scale?	Use lat and long of 18S. Draw a single ine along 16 degrees for clarity or draw a second line along 8 degrees. Draw Latitude Degree lines/labels to scale.	**Not Accepted.** Figure 1 needs to depict the entire earth's surface. Figure 2 only needs to depict an area of 24° latitude by 18° longitude. It is not possible for Figure 2 to illustrate the area in Figure 1 at a scale that would fit in the document and still be readable, and it isn't necessary. The Figure has been modified to increase clarity regarding the 16° latitude line. Drawing to scale does not increase the utility of the figure.
42	FGDC-Robinson-33		Figure 3	T	Show the GZD boundaries.	Draw GZD dark lines horizontally not just vertically	**Accepted in principle.** The figure has been improved for the final draft.

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43	FGDC-Robinson-34		Figure 8	T, E	Map portion of the figure is difficult to read if not unreadable	Use better resolution for presentation of the map.	**Accepted in principle.** We agree that the readability of this graphic should be improved, however, we were not able to accomplish that for the final draft. We are continuing to work on it and hope to have an improved graphic for the published version of the standard.
44	FGDC-Robinson-35			G	Does this document refer only to horizontal referencing? What about vertical? Users, maps and locational services will need vertical reference as well. Is there a simple way to include a vertical aspect to this system?	Clarify: Horizontal system only or Consider Vertical component.	**Not Accepted.** Yes, this is a horizontal reference system as currently defined. However, a vertical component could be added in a number of different ways. The current specification does not define any vertical component because we do not see any practical use of that for the applications envisioned for this standard. But then we also do not see any reason why such use should be explicitly prohibited by the standard. There may be applications of this standard that we have not anticipated that could make use of a vertical component. We believe that it is sufficiently clear that only a horizontal reference system is adopted by this standard and see no reason why we should prohibit the standard's use with a user-defined vertical component.
45	FGDC-Robinson-36			G	Who is the Federal sponsor for this Standard?	Include Federal sponsor	**Accepted – No Action Required.** The FGDC Standards Working Group is the federal sponsor. The FGDC SWG appears on the title page in the location identified by the FGDC standards directives for the Federal Sponsor. No change required.
46	FGDC-Robinson-4	P.1	Line148	T	"a number coordinate reference systems" This seems miss leading as there are infinitely many coordinate systems	Suggest: "a number" be replaced by "many"	**Accepted.** The proposed change is reflected in the final draft.
47	FGDC-Robinson-5	P.1 and through out the document	Line 153 and others	G	"humans" is not user friendly.	Replace "humans with "user" or "citizen"	**Not Accepted.** The choice of the word "human" may not seem user friendly, but it is what is meant. The word is used to distinguish an interface that has a human on one side from an interface that has a machine or software

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							application on both sides. The word "user" does not make this distinction because a machine or software can use a coordinate in much the same manner as a human. The word "user" then has too broad a connotation. The word "citizen" seems to be unnecessarily narrow in its connotation since both citizens and non-citizens alike are human and intended to be included in the interface that we are defining. We believe that the word "human" connotes exactly what we mean. Also, the Open System Interconnect (OSI) architecture defined by ANSI uses the term "human" when describing this interface and it is therefore consistent with other information technology standardization.
48	FGDC-Robinson-6	P.1	Line 156	T	"spherical coordinate reference systems, like latitude and longitude," Since latitude and longitude for the earth are referenced using geodetic latitude and longitude suggest re-wording	Suggest: Furthermore, it is difficult for users to accurately determine a location coordinate from paper maps when latitude and longitude are used, because they do not usually appear square on the map.	**Accepted.** The proposed change has been incorporated into the final draft.
49	FGDC-Robinson-7	P.1	Line 157	T	"As a consequence paper maps created for the general public frequently have a square reference grid that overlays the non-rectangular coordinate reference system." This seems misleading rectangular and non-rectangular are based on your geometry of reference.	Suggest: As a consequence paper maps created for the general public frequently have a square overlay reference grid.	**Not Accepted.** The proposed change would alter the intended meaning. It is established in the preceding sentence that we are talking about the latitude-longitude grid that is not rectangular on some maps. We believe that the sentence is clear and no action was taken.
50	FGDC-Robinson-8	P2	Line 167	G	"standard seeks to improve the current situation." Seems vague can you be more specific?	Suggest: This standard identifies a single nationally consistent grid reference system, the U.S. National Grid (USNG).	**Not accepted.** If read out of context, we would agree that the sentence could be considered vague but in the context of the previous paragraphs that explain the "current situation" in detail, it is anything but vague. The proposed change just repeats what is already found in the very next paragraph under "Scope."
51	FGDC-Robinson-9	P2	Line 168	G	Why should this be the preferred grid for NSDI? There are many grids each has	Delete "as the preferred U.S. National Grid (USNG) and promoting its use	**Not Accepted.** See response to Comment 38 [FGDC-3].

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					it's own benefits and user preferences. Let users decide if this is their preference.	within the NSDI." See wording above	
52	KBH-1				I have several objections to using the MGRS for the U.S. Grid. MGRS uses the UTM latitudinal zone letters in it's designation but the MGRS grid does not consistently bound or coincide with those latitudinal zone boundaries. That situation produces many conditional operations. Next, the grid letter designations of MGRS are purposely inconsistent from one zone to the next. That situation requires the use of either an algorithm or a map to make comprehensive use of MGRS locations. In explaining these opinions in forums, I developed a grid reference system that avoids conflict with the UTM latitudinal zone boundaries and that predictably uses the same grid divisions in every UTM longitudinal zone while minimizing the number of required parameters. This grid reference system is KBH Grid Reference (KBHGR) for UTM and was developed by (myself) KBH, KBH Software, metro Atlanta, GA. Obviouly my proposal is that KBHGR be adopted as the new US Grid and that use of the system be licensed from (myself) KBH		**Not Accepted.** The comment suggests use of a proprietary system. We responded to this individual by e-mail and pointed out that the FGDC Standards Reference Model requires that FGDC standards be in the public domain. We offered to further consider his proposal if he could allow use of his system without a license. We received a response that he would consult his lawyers. No action was taken. Response to the specific criticisms: The latitudinal boundary issue does not present problems in practice. Regarding, "…the grid letter designations of MGRS are purposely inconsistent from one zone to the next." The two-letter identifications repeat every 18° of longitude and are staggered in a sequence that lengthens the distance between 100,000-meter squares of the same identification.
53	KBH-2				The following is an informal example of the development of KBHGR: [Beginning of example] Here is an example of the KBH Grid Reference (KBHGR) for UTM: Where the North coordinate is 3319216, the East coordinate is 596451, andthe longitudinal zone is 1: The KBHGR to the nearest meter would be: 1d596451319216. Then to a 100 metersquare the KBHGR would be:		**Not Accepted.** See response to Comment 52.

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					1d59643192 where the first number of the grid reference is the UTM longitudinal zone. Theletter designation is a notation representing the number of million metersfrom the equator. And the numbers following the letter designation areabbreviated UTM East and North coordinates where a letter designation of a = 0b = 1c = 2d = 3f = 4g = 5h = 6j = 7k = 8m = 9 Again, the letter designation of KBHGR represents the number of millionmeters from the equator. One issue to be resolved is whether to use the'Column One' letter designations or the 'Column Two' letter designations asfollows: Column Onea = 0b = 1c = 2d = 3f = 4g = 5h = 6j = 7k = 8m = 9 Column Twoa = 0b = 1c = 2d = 3f = 4g = 5h = 6i = 7j = 8k = 9 Finally, 'N' or 'S' for hemisphere can be added to the beginning of the KBHgrid reference or left off when unnecessary. The letter designation column selection announcement will be on July 2,2001. Now, the KBHGR example was not a full description. The KBHGR can be hierarchical in that the leading digit of the abbreviatedcoordinates can always be omitted by adding further letter notation to theexisting letter notation. The only required pattern is that there should beone more letter designation attributed to the North coordinate than isattributed to the East coordinate. In other words 1d596451319216 (to the meter) could also be developed as1ddg9645119216 and 1d59643192 (within a 100 meter square) could be developed as1ddg964192. Now realize that the longitudinal zone number in some cases is a two digitnumber and add the optional zero for 01ddg964192. Finally, if needed add theoptional hemisphere designation		

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					for N01ddg964192. Note that the purpose of the optional hierarchical letter notation is reallyto allow options for map sheet numbering and lettering. Finally, the preliminary choice of letter designation is 'Column Two' whichis as follows: a = 0b = 1c = 2d = 3f = 4g = 5h = 6i = 7j = 8k = 9 [End of example] Thanks for receiving this e-mail. Sincerely, KBH		
54	KBH-3				In a previous e-mail I questioned the use of MGRS for the U.S. national grid. My objections to MGRS could be summarized by saying that MGRS does not have a natural efficiency and by saying that I have developed a grid reference system that does have a natural efficiency. The grid reference system for UTM that I have developed is 'KBH Grid Reference' (KBHGR) for UTM. I would propose that KBHGR be adopted as the U.S. national grid and that it's use be licensed from (myself) KBH of KBH Software. Obviously for that development to be possible there would have to be reviews and tests of KBHGR in addition to initial non-approval of MGRS. One note: The issue of MGRS for the U.S. national grid has just recently reached GPS forums on the internet and full response from GPS users may not be in before the response date deadline. My previous e-mail included informal examples of KBHGR that I contributed to forums. A formal description of KBHGR is available at the following web page address: http://pages.prodigy.net/halsteadinvest/kbh-gr.htm		**Not Accepted.** See response to Comment 52.
55	Lyon-1				I recommend using the Maidenhead Grid System which is already used by Amateur Radio Operators worldwide. For more info see http://www.arrl.org/locate/gridinfo.html .		**Not Accepted.** The Maidenhead Grid System was evaluated early in the development process and found deficient in several areas. Foremost, it does not provide the degree of precision

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					http://www.arrl.org/locate/gridinfo.html .		required for applications of a US National Grid.
56	Maak-1				I welcomed the opportunity to comment on the new standard. As an Army Officer, I have been using MGRS for some time and have been a proponent for the use of a similar system for the "National" mapping concerns of the country. During a meeting at TEC headed by MK Miles about 3 years ago, he led a discussion about mapping requirements for the Mississippi River- This very issue came up.		**No Response.**
57	Maak-2		Line 742-		APPLICTION - I don't know if this is a correct spelling -Not in Webster's II		**Accepted.** Spelling corrected.
58	Maak-3		Line 708-709		Cartographic Anarchy- Great description! I hope it isn't copyrighted!		**No Action Requested.** There is no copyright. The document is in the public domain and may be freely quoted in whole or in part. Just remember that you heard it here first.
59	McLaughlin-1				Finally! I am glad to see the advent of such a system; addressing needs a standard across the board. The usefulness of this system will greatly benefit Emergency Services Operations.		**No Response.**
60	Neunzert-1				What is your UAC ?(Universal Address Code)This is a somewhat belated attempt to provide public input to the U.S. National Grid (USNG) Standard. The national E911 response should be as simple as possible, therefore my recommendation is:even though technically correct, DO NOT mix letters and numbers for a position location to 10 meters, but locate by a 10 digit UAC (Universal Address Code) number code only.Background:I am Gaby Neunzert, Professor Emeritus, of Surveying and GPS, from the Colorado School of Mines. Until I was made aware of your proposed USNG standards, I had originally prepared a manuscript for future publication in a surveying		**Not Accepted.** A method for truncating UTM coordinates similar to the one suggested by the Commenter was evaluated early in the development of this standard. It was found deficient in several areas. (It should be noted the Commenter has suggested describing abbreviated coordinates with the northing axis first, and then the easting. While used in some surveying applications, this method is contrary to the UTM convention widely used by the general public for describing UTM values with the easting first, and then northing. This aspect of the Commenter's proposal would add confusion if implemented.)

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					publication, outlining a UTM based emergency response. In it, I concluded that to the nearest meter, a complete numerical UTM position (zone, northing and easting coordinates) consisting of 15 digits, can be reduced to only 10 numerical digits called UAC (Universal Address Code) in order to identify its abbreviated format. Just like your proposal, a 10 meter accuracy is perfectly adequate for all positional requirements, therefore eliminating the last or unit digit(s) of a UTM coordinate. For a human response in most local areas, the UTM zone, i.e. 2 digits, can be eliminated, as well as the million digit in the northing coordinate, thus resulting in a UAC of 5 digits for northing and 5 digits for easting; the computer on the other hand can be made to remember all 15 original digits. For example, my complete UTM coordinate address is: 13-4403516-485427 and therefore my UAC is: 40351-48542. It should be noted that the proposed 10 digit code is the same length as my telephone number.With the intent of providing as simplistic system as possible the following scenario is envisioned:1 – The GPS manufacturers build a GPS receiver which can be located on the dash of a car, rescue vehicle or aircraft, with a UTM coordinate display – this is basically a recreational GPS receiver commercially available for about $100; Plus, and this will have to be added to currently available receivers: a 10 digit keyboard (just like a cell phone).2 – The "sender" of the location can either:a) Activate the "MOB (Man Over Board)" function originally available on most recreational GPS receivers and automatically transmit, via radio, the location as a "homing beacon" to all		The use of only UTM numerical values in a truncation scheme severely limits the area over which the Commenter's proposed method provide a unique value as compared to the MGRS format. In practice, the mixing of letters and numbers has not been found to be a problem. Breaking the spatial reference value into three segments, and using two-letter IDs for the middle segment reduces confusion while increasing the strength of the format.

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					concerned, orb) Manually enter the 10 digit UAC code; this however requires that the user enters something familiar, i.e. a numerical code and NOT a numerical and letter code. 3 – The "receiver" of the location can either:a) Automatically, via radio, enter the UAR code into the GPS receiver and thus have the heading (direction) and distance to the target, orb) Manually enter the 10 digit UAC code; this however requires that the user enters something familiar, i.e. a numerical code and NOT a numerical and letter code, and again have the heading (direction) and distance to the target.4 – A non GPS user can either: a) "Pick" the UTM coordinate location from an available USGS topo map and transmit this information to the rescuers; this however requires that the computer in the rescue GPS units "screens out" the extra digits; orb) Direct the rescue "conventionally" on a map. Note: USGS maps only show numerical UTM values ! It should be obvious that the above represents only a reformulation of existing concepts and as a result should be easy to implement.Even though GPS receivers can be set for either the NAD'27 or NAD'83 data base it is very unfortunate that the difference in ground position can range from 100 ft to 700 ft plus. Since most civilian paper maps are NAD'27 based, it is suggested that initially all GPS receivers are set to this data base; by regional agreement a change can be made at a later data.		
61	Ramsay-1				United States National Grid Proposal - Generic CommentsOn November 14, 1949, the Joint Chiefs of Staff adopted the UnitedStates National Grid, except they called it the Military Grid		**Not Accepted.** We can appreciate the sentiment that "a better" map coordinate system can be devised. However, other comments support our belief that the immediate need dictates a practical

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					ReferenceSystem (MGRS).After a half century, why is the MGRS/USNG virtually unknown to civilians? Because, it is not suited to civilian use.The Standards Working Group has erred in putting the cart before the horse. Before considering any map coordinate system the SWG should write basic standards against which the merit of proposed coordinatesystems may be judged.A better map coordinate system than USNG can be devised.		solution that can be implemented quickly and with minimum disruption of current mapping practices. This is one reason for basing this proposed standard on the MGRS. For those counter-opinions, see Comments 62, 64, and 66. One reason the MGRS may not be as widely known to the civil population is it is not generally portrayed on USGS products. This is not to infer it is not suitable for civil applications that are similar to what MGRS was developed for. Furthermore, the Commenter has not explained what characteristics make this system unsuitable for civil applications for which it is to be used. The preparation of this standard was based on requirements developed early on in the process. A set of criteria was prepared on which to evaluate the selection of a reference system. They were; 1) The development effort would first seek to use an off-the-shelf and proven system that met the below requirements prior to developing something new. 2) The system should be in the public domain and non-proprietary. 3) The system should be mathematically uniform, and referenced to the figure of the earth. 4) The system should be a plane coordinate system for ease in scaling positions on large-scale maps. 5) The system should be seamless at political boundaries and extensible across international boundaries.

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							6) The system should possess flexible characteristics that include powerful truncation/abbreviation features and provide the user with the ability determine the degree of precision to which a spatial reference value is given.
62	STIA-1				Dear Ms. Maitra The members of the Spatial Technologies Industry Association (STIA) have reviewed the proposed standard for a United States National Grid For Spatial Addressing. On behalf of the STIA, I am pleased to provide the following comments:1. Designation of the proposed U.S. National Grid (USNG) as a preferred standard for spatial addressing would be an extremely positive step toward integration of wireless communications, the Internet and commercial businesses into a mobile e-commerce enterprise facilitated by signals from the Global Positioning System (GPS). A critical factor in the ability of the general public to effectively employ the Internet and conduct wireless e-commerce is the capability to dynamically provide position information, but there is not at present a commonly accepted or standard means of portraying those GPS positions in large-scale paper maps such as city map books. Such books and other map products, even in the evolving digital environment, continue to provide a preferred means for people to understand locations and destinations. Both paper and digital map products would significantly benefit from adoption of a preferred standard grid to improve the ability of the public to use GPS information for locating places and selecting routes.The proposed USNG standard is innovative in its use of non-		**No Response.**

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					proprietary standardization to facilitate broad acceptance and use. The fact that it is based on the long-standing Universal Transverse Mercator grid enhances its usefulness as it is consistent with other large scale grid standards already in use around the world.2. In addition to its commercial benefits, we strongly believe adoption of the USNG standard will dramatically improve ease of use for GPS equipment and applications in nationwide E-911, general emergency response and disaster response. Having recently sponsored a forum with ComCARE Alliance on how spatial technologies such as GPS can enable E-911, the STIA is a strong advocate for their effective implementation. An absolutely essential component in that implementation is the ability to identify accident and emergency response locations in ways that are unambiguous and broadly applicable. Defining the USNG as the preferred means of relating GPS positions to large scale planar map products provides that broad utility. We believe it will rapidly produce nationwide benefits to emergency response organizations through identification of a common means of identifying accident and disaster locations anywhere in the country. We endorse the USNG as the preferred horizontal reference system for mapping at scales of 1:1,000,000 and larger.We thank the Federal Geographic Data Committee for the opportunity to comment and commend its vision in producing the proposed USNG standard. Adoption of the USNG as a preferred standard will be a major step toward enabling the effective integration of spatial electronic technologies for the nation's benefit.		

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63	Town of Nantucket, MA - Wood, HO - 1	3.3.2	Tables 2&3	G	The proposed MGRS scheme for 100,000-meter Square Id's is potentially very confusing (i.e., the scheme varies for different GZD's).	The subset grids within each GZD should be defined such that the identification scheme for each such grid should be identical within each GZD 6x8 degree area.	**Not Accepted.** The 100,000-meter Square Identifications have not proven to be confusing in practice. The system design allows a given two-letter square ID to be unique over a very large, regional size area and is a powerful feature. The proposed change would make the USNG incompatible with the MGRS and we are reluctant to accept that consequence without a more convincing argument that the system of square identification proposed is confusing.
64	Trimble-1				I have had an opportunity to look over the proposed standard for a United States National Grid (USNG) as posted at the Federal Geographic Data Committee web site. I am writing to you as a private citizen to let you know that I am very enthusiastic about the possibilities inherent in such as standard if it is adopted for general public use. As a pioneer in the applications of Global Positioning System technology as an information resource, I am well attuned to the sometimes innocuous factors that promote technology acceptance and enable its efficient and effective use by the public. Also, as a founder of Trimble Navigation, Ltd., a GPS industry leader, though I am not currently involved in its day-to-day operations, I am technically very well versed regarding the many issues involved in manipulating diverse grid systems to portray position locations to users. From both these perspectives, I believe the United States would be well served to adopt the USNG as a preferred standard for geoaddressing using GPS. Early adoption and use of such a standard will reduce confusion among government agencies and jurisdictions regarding which reference systems are		**No Response.**

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					preferred for various purposes, particularly related to emergency response and disaster relief. It will also aid the public in communicating GPS position information and in applying that information to the myriad applications that GPS will enable across the National Information Infrastructure.Thank you for the opportunity to comment. I reiterate my strong personal support for early adoption of the USNG as a preferred reference system.		
65	Truebe-1				I don't know any of the details of the new standards but I would like to venture an opinion - Whatever you do make it metric! I commonly work internationally and I prefer to use an international dimensional system, even in the US. It is so much simpler.		**Accepted – No Action Required.** The USNG is metric.
66	USGPSIC-1				The U.S. Global Positioning System (GPS) Industry Council (USGIC) has reviewed the proposed standard for a United States National Grid (USNG). As a preferred standard for spatial addressing, we believe the USNG would provide tremendous benefit in advancing adoption of GPS technology by the American public. Even in these early years of its operation, applications of GPS promise to provide enormous improvements in safety and efficiency to all sectors of our national economy. However, the ability of diverse users, and in particular the general public, to fully realize those benefits depends on their ability to easily relate GPS positions to the world around them using a uniform community standard for geospatial reference.Geospatial relationships are most effectively portrayed in large-scale maps and in digital displays of map		**No Response.**

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					products. In this instance, even digital maps would benefit from a standard reference system for public use. Further, until digital map presentations can be produced in transportable and robust display sizes that enable locations to be displayed in a city or metropolitan context, without losing fidelity, paper maps with a standard grid will remain an essential information application. The USNG satisfies the need for that standard grid precisely and will be extremely useful to the public, to providers of emergency response services and to commercial businesses. The USNG format is well proven and easy to understand. The fact that it is a non-proprietary grid will facilitate its rapid adoption as a preferred means of relating GPS positions to map products for any location in the US as well as internationally. Identification and use of a preferred system will help reduce the number of coordinate systems that occupy memory and processing power in low cost GPS receivers. Some coordinate systems have local zones of very complex shape requiring extensive memory to define them. A preferred community standard will allow us to focus future GPS applications on feature and commerce data of use to the public rather than on redundant reference systems.We commend the Federal Geographic Data Committee for its vision and foresight in advancing the proposed USNG standard for public comment and we strongly support its prompt adoption. Such an action will significantly enhance public acceptance and use of modern space-based Global Positioning System technology to improve the nation's infrastructure. We appreciate the		

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					opportunity to comment.		
67	USGS, Hogan – 2			G	The USGS is less enthusiastic about the specific choice of the grid to serve as the US National Grid found in the draft standard. This is simply because as the maintainer of over 55,000 topographic maps in the 1:24,000 scale series alone, any change to existing map standards is problematic. The problem is mitigated to some degree by the choice of MGRS as the basis of the US National Grid since it is compatible with the UTM grid we already provide. The choices of UTM or Latitude/Longitude would be less difficult for us to implement on exiting map products. However, we believe that the benefits to the public of adopting a single grid outweigh the difficulties the USGS has in implementing the current proposal. Other USGS comments have suggested specific changes that would further mitigate the implementation of this proposed standard for the national mapping program.	No change proposed	**No Response.**
68	USGS, Hogan – 3	1.4	Line # 219	T	Although it was anticipated that ISO 19116 would reach the Draft International Standard (DIS) stage by the time this standard was finalized, it has not reached that stage as yet. During the final edit of this standard the status of ISO 19116 should be checked and the final text of this standard should reflect the status of ISO 19116 at that time.	Check status of ISO 19116 before submitting final text of this standard and change the designation of ISO 19116 accordingly.	**Accepted.** No action was taken for the preparation of the final draft. The status of ISO 19111 will be updated in the final text for publication.
69	USGS, Hogan – 4	3.1	Line # 269	T	We believe that the MGRS practice of providing different 100,000 meter Square Identifiers for NAD83 and NAD27 applications is unnecessary for the general application of the US National Grid (see comment USGS Hogan - 8)	Revise sentence to read: "USNG coordinates shall be identical to the MGRS NAD83 numbering scheme over all areas of the United States . . . "	**Accepted in Principle.** A single 100,000-meter Square Identification set has been adopted for the US National Grid. While this will deviate from MGRS when NAD 27 is used, the system will remain identical to MGRS when NAD 83 is used. The text in question does not specify "MGRS NAD83 numbering" just "MGRS

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							numbering", however, normative Figure 2, which provides the numberings scheme for the 100,000-meter squares, includes only the NAD 83 numbering and no other. In addition, Annex E (Annex G in the public review draft) on numbering of the USNG for NAD27 applications contains a sentence similar to that what is proposed here.
70	USGS, Hogan - 5	3.3.2	Line #296	T	See comment USGS Hogan – 4 [Comment 69]	Change sentence to read: ". . . shall be taken from the scheme defined by the MGRS for NAD83."	**Accepted in Principle.** The sentence was deleted. Also see response to Comment 69.
71	USGS, Hogan - 6	4	Line 321-322	T	See USGS Hogan – 8 [Comment 73]	Modify these two lines as specified in USGS Hogan - 8	**Not Accepted.** See the response to comment 73 [USGS Hogan – 8]. The changes requested for this clause were largely made in Annex E (informative) but not in this clause (normative).
72	USGS, Hogan – 7	Annex A	All	E	It will be much easier for the reader if these figures were placed within the text of the clauses that reference them.	Delete the Annex and move the figures into the body of the text.	**Accepted.** The normative figures appear within the body of the text in the final draft.
73	USGS, Hogan - 8	Annex B	All	T	The adoption of a separate 100,000 meter square identification scheme for NAD83 and NAD27 is not necessary to accomplish the objectives of the USNG and unnecessarily complicates the implementation. The standard datum for the USNG should be NAD83, as stated in Clause 4, as GPS coordinates are referenced to WGS84. The accuracy of the USNG will be compromised when it is applied to maps using other datums. For NAD27 the potential error is as great as ~200 meters. For many applications of the USNG, the error inherent in use of the USNG with NAD27 will be well within acceptable tolerances for that application. We believe that using the same 100,000 meter square identification scheme for both NAD83 and NAD27 maps will improve users' understanding and acceptance of the	Delete Annex B in favor of a revised Clause 4 that: 1) allows the use of USNG on: a.) expression of coordinates will be as currently specified in B.2. b.) a note explaining the potential error when the grid on an NAD27map is used in conjunction with GPS or other maps based on NAD83. 2) clarifies that the USNG shall not be used on maps based on datums other that NAD83, WGS84, ITRF, and NAD27. 3.) 3) specifies that the 100,000 meter square identification shall be the same for NAD83 and NAD27 applications.	**Partially Accepted.** A single 100,000-meter Square Identification set has been adopted for the US National Grid. While this will deviate from MGRS when NAD 27 is used, the system will remain identical to MGRS when NAD 83 is used. See response to Comment 69. Annex B (now Annex A) was not deleted and text inserted into this clause as requested but parts of it were moved from the normative annex to the informative Annex G (now Annex E.). No discussion of the potential differences in NAD83 and NAD27 USNG coordinates for the same point location has been added. The requested clarification on datums has been included in informative Annex

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					standard, expand its use, but not significantly impact the usefulness of the USNG as a result of the inaccuracies produced. There are still many map products in use, based on NAD27. Excluding the use of the USNG on them or creating a separate implementation of the USNG for them is not necessary and will greatly reduce the benefits of the standard. We do agree, however, that the use of the USNG on map products based on the NAD27 datum must be qualified.		E of the final draft along with the requested clarification on 100,000-meter square identifiers.
74	USGS, Hogan – 9	Annex E	All	E	It will be much easier for the reader if these figures were placed within the text of the clauses that reference them.	Delete the Annex and move the figures into the body of the text.	**Accepted.** The informative figures appear in body of the text of Annex C in the final draft..
75	USGS, Hogan –1			G	The USGS supports the idea of establishing a single preferred grid for the United States. It has long been USGS policy to adopt the use of a single grid system to be portrayed on all USGS topographic maps. Current USGS policy adopts the use of UTM as the primary grid on USGS map products. In establishing that policy, the USGS encountered numerous opinions on which grid was the best grid and determined that no grid is "best" for all applications. But the USGS also determined that the users of topographic maps would be better served by the consistent use on a national basis of a single grid and that the benefits of such a policy on the whole outweighed the negatives in specific instances. This policy was established long before the common use of GPS. We agree that this new technology provides a renewed and compelling argument for adoption of a preferred national grid for the United States. We also strongly agree that the public will greatly benefit from a wider adoption of this policy and, therefore,	No change proposed	**No Response.**

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					support the creation of a US National Grid for use throughout the NSDI. The enormous potential of a consistently applied map grid provides for protection of life and property during times of national emergencies cannot be overlooked.		
76	USGS-Conroy-1	2/2/page 6	line 263	E	The use of the term "will usually" makes this sentence confusing. There is no explanation for when the USNG will not be printed on the map according to this specification.	Either rewrite this sentence or add another one to explain when the USNG will not be printed on the map according to this specification. A suggested rewrite could be something like, "This will mean that the USNG will be shown on all revised maps according to the guidance in this specification." A new sentence could be something like, "The USNG will not be shown on maps according to the guidance in this specification on maps that have not been revised."	**Not Accepted.** The intent of this clause is to state what is required to conform to this standard. The preceding sentence, to the one in question, provides a clear explanation of the requirement. It is Clause 1.3 that provides guidance on when the standard should be applied, but only in general terms. It is left to map producers to determine for themselves the specific criteria for when they will apply the standard and when they will not. The proposed change, if accepted, would belong in Clause 1.3 and not here, however we believe that the details of applicability given in the proposed change are more appropriate to individual map producers procedures and should not be standardized for all users.
77	USGS-Conroy-2	4/2/page9	line 321	G	The USGS retains the original horizontal datum of maps when preparing minor revisions. Hawaii, the Alaskan islands of St. Lawrence, St. Matthew, St. Paul, and St. George, and the U.S. outlying areas of American Samoa, Guam, and Puerto Rico were originally mapped on their own horizontal datum. There are no instructions in the draft standard about how to implement the USNG on minor revision maps of those areas. Line 274 says the USNG applies to all areas of the United States, including outlying territories and possessions.	Provide instructions for how to implement the USNG on maps of Hawaii, the Alaskan islands of St. Lawrence, St. Matthew, St. Paul, and St. George, and the U.S. outlying areas of American Samoa, Guam, and Puerto Rico when the original local horizontal datum is not converted to NAD 83.	**Not Accepted.** This clause specifies NAD83 and its functional equivalent, WGS84, as the standard datum for use with the USNG. Additionally, provision is made for NAD27 as an exception. The USNG is not specified for any other datum, so no instructions for its implementation on maps with other datums will be provided.
78	USGS-Conroy-3		figure 2	G	The rest of the figures use the Fairfax, VA quadrangle in the examples. Figure	Change the example to one that includes the area of the Fairfax, VA	**Not Accepted.** Figure 2 is purposely generic and is taken from the

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					2 applies to an area along the International Dateline in the Pacific Ocean. For consistency, this figure should apply to the area that includes the Fairfax, VA quad.	quadrangle.	specifications for the MGRS. We see little benefit in revising it to match the Fairfax examples.
79	USGS-Conroy-4	B.1/1/page 17	line 386	G	Single edition maps and the great majority of minor revision maps are produced on NAD 27. Obtaining copies of NIMA standards is very difficult because NIMA normally does not allow distribution of their standards. Last year, we made several unsuccessful attempts to obtain a copy of the standard referred to in the draft for use as a reference by the Forest Service, which had exhausted its previous efforts to obtain a copy.	Considering the number of maps that are produced on NAD 27 and how difficult it is to acquire a copies of NIMA standards, it would be much better to include a copy of the figure that is being referred to in annex B.	**Not Accepted.** This issue is superceded by the decision to use a single 100,000-meter Square Identification scheme. The figure in question is no longer applicable to this standard. Also see the response to Comment 73.
80	USGS-Conroy-5		figure 6	E	The full UTM values are shown along the SE corner on USGS maps, rather than the SW corner. As stated in the caption of this figure, showing the 100,000-m values in superscript on every truncated UTM value is a well-established convention on USGS maps. However, two of the truncated UTM values in the figure lack superscript numbers.	Change the example to reflect the SE corner of the map so the full UTM values can be shown properly. Show the 100,000-m values in superscript on all truncated UTM values. In the example shown in figure 6, the superscript "2" is missing on the 97 principal digit along the south projection line and the superscript "42" is missing on the 94 principal digit along the west projection line.	**Accepted in Part.** The figure has been changed to reflect the SE corner of a map sheet. The change requested to depict full UTM values in the SE corner vice the SW corner has also been accommodated. While it may be the policy of USGS to depict all UTM values in the manner described, this is an optional method under this standard. It should be remembered, this standard applies to a larger audience of maps than only USGS. Some map producers may choose to only depict the principal digits (in full size) for each grid line, as long as at least one full set of UTM values are depicted on a map, preferably in the South East corner. In Figure 5, the principal digits "94" and "97" do not depict the superscript UTM values by design.
81	USGS-Conroy-6		figure 7	G	The full UTM values are shown along the SE corner on USGS maps. Although the UTM values are different in figures 6 and 7 (which in itself is confusing), showing the full UTM values in the SW corner in	Show the full UTM values in the SE corner of the example. Delete the east, west, and north neatlines the same way the north and east neatlines were deleted in figure 6. For illustrative	**Accepted as Modified.** A new Figure 7 has been added to show labeling for a map completely within one 100,000-meter grid square. The old Figure 7 (now Figure 8) has been revised to

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					figure 7 seems to be repeating the same mistake made in figure 6. Showing the 100,000-m values in superscript on every truncated UTM value is a well-established convention on USGS maps. The superscript numbers are missing on three of the UTM values in this figure.This example is misleading. The UTM type shown here is almost twice the size that it actually is on USGS maps. Showing the interior 100,000-m square ID's on a blank, white background disguises the fact that the IDs will often overprint interior map labels and either obliterate or be obliterated by other map detail. The larger the type, the more likely it will conflict with map detail. The interior IDs are not necessary because of the exterior ID labels. The user probably won't even be able to find the interior labels without first locating the exterior ones. There are no instructions how to show either the interior or exterior 100,000-m square IDs on the great majority of 7.5-minute quads that are in one 100,000-m grid zone.UTM labels are not shown on USGS maps when they conflict with geographic coordinate labels, which have precedence over all others. State plane labels normally have precedence over UTM labels, except when there is no other way to show a full UTM label in the SE and NW projection corner. The exterior 100,000-m square IDs may conflict with geographic coordinate or State plane labels. Adjusting automated collar programs, which are used on all minor revision, basic revision, and single edition maps, will be difficult and time-consuming without more specific guidance.	purposes, retain the UTM values on all four edges of the illustration.Show the 100,000-m values in superscript on all truncated UTM values. In the example shown in figure 7, the superscript number "42" is missing on the 98 principal digit along the east projection line and the 94 principal digit along the west projection line. The superscript number "2" is missing on 98 along the north projection line. Show the UTM and 100,000-m square ID labels in their actual size.Eliminate the requirement to show interior 100,000-m square IDs.Provide an example of how to show interior and exterior 100,000-m square IDs when the quad is in one 100,000-m grid zone.Provide an explanation of what to do if a 100,000-m UTM or ID label conflicts with a geographic coordinate or State plane label.	show full UTM labeling on the SE corner per the USGS practice. Interior 100,000-m Square IDs must be depicted to facilitate map use and is a well proven method. Some points the Commenter makes are well appreciated regarding the implications of interior marking of these intersections, but they can be accommodated without undue problems. For example, this method is successfully used on Ordinance Survey maps (Great Britain) and National Imagery and Mapping Agency (NIMA) products. Typically, the exact positioning of a two-letter Square ID can be adjusted to minimize the impact on other map detail. A variety of grid reference box examples are depicted in Figure 4 and these provide a means for depicting Grid Zone Designations and the 100,000-meter Square Identifications. The first example (upper left example) in Figure 4 depicts how to show the 100,000-m Square Identification for a map sheet that lies entirely within a single 100,000-meter Square. In such a case, there is no need to provide an interior showing of the 100,000-meter Square ID. The new Figure 7 now provides an example of this. When the 100,000-m Square ID, UTM grid line label, geographic coordinate, or State Plane label conflict in placement, normal USGS methods for deconfliction can be applied for USGS operations. This standard does not attempt to specify map production procedures to that level of detail. The nature of the 100,000-meter Square ID provides the

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							cartographer with discretion in placement because it identifies a large area, and not a single grid line value intersecting with the neatline. The placement of the 100,000-meter Square ID in these circumstances can be easily adjusted so as to not fall directly on one of these other labels.
82	USGS-Conroy-7		figure 8	G	The scan used for the map in this figure is of embarrassingly poor quality. The wording and form of the collar notes on the map in this figure are out of date. Since the grid reference box will only be put on new revised and minor revision maps, it would be much more practical to either update the collar notes or use a recently printed map for an example. If a different map is used that map should also be used in the rest of the figures. The dates used for the planimetry note and declination diagram are unrealistic. We will never show the grid reference box on a map with the planimetry current as of 1994 or the declination data current as of 1995. The declination diagram is shown in the wrong position.The recycle logo is missing.There is not enough space to show the grid reference box at this size and in the position shown in this figure on maps in the northern half of the contiguous US. There is no space to put the grid reference box at this size and in this position on any topo-bathy or Alaska quads. There may be room to fit it in on some single edition maps but the space will be lacking on most quads in the north half of the country. Even on maps such as the Fairfax, VA, if the declination diagram were shown in the correct current position, the type from the top line of the declination diagram would come close to touching the outline of the grid reference box. USGS map collars	Improve the quality of the map scan.Either replace the map example with a current, recently printed one or update the collar information to portray how the grid reference box will actually be presented. Refer to the style sheets in appendixes 2B, 2C, and 2D of the Standards for Revised Primary Series Quadrangle Maps for the current wording and form of collar notes and the positioning of the declination diagram and recycle logo.Add “and other sources.” to the end of the planimetry note. Delete the dashed contour note. Obsolete contours are no longer shown. Add “Boundaries current as of (year)” to the compilation note. Use “2001” for the planimetry, boundary, and declination dates. Add the following building currentness note: “Houses of worship, schools, and other labeled buildings verified (date of last field check)”. In the example in figure 8, the buildings currentness date would be 1966 (the same as the PLSS and survey control date). Move the declination diagram up to make room for the recycle logo.Add the recycle logo.Either reduce the size of the grid reference box and move it below the declination diagram alongside the recycle logo or (better yet) develop a different method for indicating the grid zone designation and eliminate the grid reference box.	**Accepted in Principle.** We appreciate and agree with the comment. We would have been more appreciative if the USGS had provided a better image for us to use. We have attempted to improve the example and will continue to do so, but an improved graphic will not appear in the final draft. The point of this example is to show the use of the USNG on existing USGS products and not to illustrate current USGS map standards. We will consider using an alternative example if one is furnished by the USGS but in lieu of that we feel that an example that uses any currently published USGS quad is appropriate.

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					have a reputation of having an uncluttered, balanced appearance. The position of the grid reference box in this figure would create a cluttered and unbalanced appearance. Placing the grid reference box in the side map margin is not a good solution because the Branch of Printing tries to print as many quads as possible on 22-inch wide paper to save cost. Our mapping center has actually shipped quads formatted for 23-inch printing, only to have BOP reposition the bar code and print the map on 22-inch paper. The only fixed space available on most maps will be along the upper map margin or next to the recycle logo below the declination diagram. The grid reference box at the size shown in this figure will not fit inside either the image or trim line in the upper map margin. If there are two cooperator headings much of the available space in the upper map margin will be used.If the recycle logo was moved ½-inch to the right and the height of the grid reference box was reduced to about ¾-inch, the grid reference box could be positioned under the declination diagram. The grid zone designation is the only information not labeled along the map projection. If it weren't for the grid zone designation, the grid reference box would be unnecessary		
83	USGS-Conroy-8	page 36	table 2	E	The USGS makes 1:12,000-scale maps of some islands in the Pacific Ocean and 1:30,000-scale maps in some areas of Puerto Rico. Alaska maps are 1:63,360 scale. The USGS has abandoned the 15-minute 1:62,500-scale maps.	Add the 1:12,000 and 1:30,000 map scales and grid spacings to the table. Eliminate the 1:62,500 map scale and spacing.	**Not Accepted.** The standard provides guidance for a variety of users, and is not focused only on USGS products. It is not possible to provide a table that describes grid spacing for all possible map scales. Instead, general guidance is provided from which a uniform solution can be inferred. Based on the guidance provided in the standard, a 1:12,000-scale map would have a grid spacing of 1,000-meters ground

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							distance, or 83.33mm map distance. For 1:30,000-scale maps, a grid spacing of 1,000-meters ground distance, or 33.33mm map distance. While the USGS may have discontinued products at 1:62,500-scale, this scale is still used for some commercial products.
84	USGS-Conroy-9	F.3.3/1/page 37	line 642	E	The implication of the word "similar" is open to interpretation.	Clarify what "similar" means and what characteristics of the grid reference box must be "similar."	**Accepted as Modified.** It is not the intent of this standard to detail product specifications, but rather to leave as much leeway as possible for product designers while still accomplishing the objectives of the standard. The word "similar" was specifically chosen to allow interpretation. However, we have revised the sentence in an attempt to make the guidance clearer. The sentence now reads: "Maps at scales 1:500,000 and larger should provide a grid reference box with the content illustrated in either Figure 4 or 5 (Annex C, pgs. 22 and 23) and similarly configured."
85	USGS-Fegas-1	1.1 Objective, 2nd paragraph, page 1	154-156	T	The difficulty "humans" have in accurately locating positions using latitude and longitude is greatly overstated.	Delete: "Furthermore, it is difficult for humans to accurately determine a location coordinate from paper maps when spherical coordinate reference systems, like latitude and longitude, are used because they do not appear square on the flat map. As a consequence" (and capitalize "paper").	**Not Accepted.** The wide spread use of plane coordinate systems such as the UTM and SPCS provide ample evidence that plane coordinate systems serve a very practical purpose for large scale mapping. Also see the response to Comment 90.
86	USGS-Fegas-2	1.2 Scope, 1 sentence, page 2	172	T	We need one reference grid for all scales.	Change "large and medium-" to "all." (and delete footnote)	**Accepted in Part.** The scope has been extended to all scales larger than 1:1,000,000 and the footnote has been dropped. But since there is an inherent difference in the reasons one would use a large-scale or small-scale map for determining a position, we question the assertions that a reference grid for all scales is needed.
87	USGS-Fegas-3	1.5 Standards Developme	225-255	T	We need to standardize on latitude and longitude, NAD 83.	Delete line 225 through 247 and determine a better maintenance authority (e.g. USGS) in lines 249-254.	**Not Accepted.** The desire to only use latitude and longitude is appreciated, but we believe, not supported in practice.

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		nt Process & 1.6 Maintenance Authority, pages 4 & 5					For example, such a policy would reverse the USGS policy of applying a full UTM grid that has been in effect for over 25 years. That policy was reversed in the early 1990's, but soon reinstated because of the outcry by users in part because of growing use of the Global Positioning System (GPS) receivers. These devices provide the ability to scale a position to within 10-meters on large-scale maps. At large scales, maps begin to portray the earth as a plane. The asymmetrical aspect of latitude and longitude results in a more complex reference system for large-scale map users than a plane coordinate system. Contrary opinions are expressed in Comments 62, 64, 66, and 67. We share the concern about the maintenance authority, but the FGDC SWG has determined that for the first 5 years it is in the interest of the FGDC to rely on the Public XY Mapping Project since it has demonstrated an outstanding ability to promote the standard during its development.
88	USGS-Fegas-4	3. Main Features and Specifications, pages 7 & 8	265-314	T	We need to standardize on latitude and longitude, NAD 83.	Replace these lines with text, such as a subset of ANSI X3.6.1-1986, standardizing on decimal degrees.	**Not Accepted.** See response for Comment 86 [USGS-Fergas-2].
89	USGS-Fegas-5	5.2 Precision, page 10	331-346	T	We need to standardize on latitude and longitude, NAD 83.	Replace meter references with decimal degrees.	**Not Accepted.** See response for Comment 86 [USGS-Fergas-2].
90	USGS-Fegas-6	Entire document		G	The case for a consistent simple National Grid is compelling. We need a grid system that can be applied to all of the NSDI. Latitude/longitude, based on one datum, is one simple grid system that can be applied to all of the NSDI, all	Standardize on NAD 83, latitude and longitude decimal degrees. (I advocate rejecting a system based on a military grid system until such time as the NSDI needs of the military are supreme to those of our civilian democracy. As a	**Not Accepted.** The US National Grid has been well proven in use at mapping scales of 1:1,000,000. Experience has shown latitude and longitude are not as simple to use by the

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					scales. The MGRS, however, is not one grid, but consists of multiple zones, and is in general not viable for scales smaller than 1:500,000. The problems of dealing with multiple zones should be avoided. The MGRS string of digits and letters is confusing and would require a massive education program for the public to use. Latitude/longitude, on the other hand, is well known and simple. Latitude/longitude is the defacto standard for expressing geographic positions and is becoming more and more widely used in web and business applications, such as relating GPS coordinate positions to street addresses (one of the most important requirements for emergency response). The primary referencing system GPS receivers use to report position is WGS84/NAD83 Latitude/longitude. Latitude/longitude is the basis for all other map projection-based coordinate referencing systems (such as the UTM-based MGRS); coordinate conversions are therefore facilitated (inverse projection calculations are not needed as would be the case for UTM to any other system). Standardizing on the MGRS as the "preferred" grid for NSDI applications would detract from the real need for standardizing on NAD 83 latitude/longitude.	compromise, a latitude/longitude geographic grid should still be specified as the "preferred" grid for the NSDI, but the MGRS could be specified as a less preferred alternative.)	general public as the Commenter would suggest, and in fact any system adopted infers the need for a public education program. If latitude and longitude were the panacea the comment suggests, then plane coordinate systems such as the UTM, SPCS, and the hosts of other plane coordinate systems used by other nations would simply not exist for large-scale mapping and be as widely used by the general public. National defense issues were not a basis for selecting the model on which the US National Grid is based. The fact that the Department of Defense happens to be the sponsor of a flexible methodology that readily fills the technical needs of this standard is not an objective basis for rejecting it. The fact that this standard is coincidentally interoperable with DoD systems is an added value that has been validated. For the counter-opinion, see Comments 15, 62, 64, and 66.
91	USGS-Fegas-7	Annex B	381-393		We need to standardize on latitude and longitude, NAD 83. The fact that a product is based on NAD27 AND NOT the preferred standard NAD83 should be very clearly reported.	Change "100,000-meter square identifications are" to "geographic grid is …" Remove the reference to TM 8358.1. Change the MGRS string to latitude/longitude decimal degrees. Require the "NAD27" to be bolded or otherwise emphasized.	**Not Accepted.** Latitude-longitude is not accepted for the U.S. National Grid. See the response to Comment 90.
92	Vaughan-1				I became aware of the USNG proposal through a periodial ("GPS World") after the close of the public review period.I do		**No Response.**

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					STRONGLY FAVOR the use of MGRS as a national grid standard.My experience is civilian so I do NOT have previous military exposure to MGRS as any bias in favor of it. MGRS is compatible with the UTM grids published on current USGS maps. In my experience and opinion the MGRS is more convient for field use than strictly numeric UTM and should be included on government maps/charts and the grid use should be encouraged on commercial map products whether paper or electronic.MGRS use so convenient that MGRS conversion is an absolutely mandatory requirement in my selection of hand-held GPS equipment and the first thing I do to a USGS map is to determine the MGRS grid square designation.I believe that recognition of the MGRS system as a national grid outside of strictly military use would increase the benefit from the various national positioning services available (e.g. GPS/DGPS/NDGPS) and leverage additional value for the Federal dollars expended those systems.Latitude/longitude, numeric UTM, and SPC would and should continue to be available and used as appropriate just as HARN, CORS, ITRF etc. are used in various precision applications.Thomas J. Vaughan, Jr.Graphical Software Co.298 Prospect St.Stoughton, MA 02072		
93	Winfield-1				If this is MGRS, do it. We've needed this for a long time. It's easy to teach and for others to learn.		**No Response.**
94	Markevich-1		All graphic refere		DOWNLOAD spatial Grid for"USGS-FGDC Compliance" Make all figures and Grids available as		**Accepted.** We are investigating several public domain and commercial software tools for MGRS that may be easily modified to support the USNG. As

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			nces		spatial data downloads from your websites that users can quickly overlay to reference other data. If your Grids are designated with GPS to ensure spatial accuracy, you could encourage "USGS- FGDC Compliance" to help private companies review/modify their data for accuracy - so we are all on the same page- so to speak.		suggested, these tools will be made available on the FGDC web site as soon as possible.